

**TEMPLATE FOR AN INFORMATION DOCUMENT FOR THE EU TYPE-APPROVAL OF VEHICLE, SYSTEMS,  
COMPONENTS OR SEPARATE TECHNICAL UNITS**

The information documents referred to in Regulation (EU) 2018/858 in respect of a whole-vehicle EU type-approval and in respect of the EU type-approval of a system, component or separate technical unit shall consist only of extracts from the following list and its item numbering system.

Make sure that drawings or pictures show sufficient details distinctly and visibly if printed on size A4.

Systems, components or separate technical units, referred to in this Annex, having electronic controls, information concerning their performance shall be provided.

1. GENERAL
  - 1.1. Make (trade name of manufacturer): ...
  - 1.2. Type: ...
    - 1.2.1.1. Chassis: ...
    - 1.2.1.2. Bodywork/complete vehicle: ...
    - 1.2.1. Commercial name(s) (if available): ...
    - 1.2.2. For multi-stage approved vehicles, type-approval information of the base/previous stage vehicle, list the information for each stage. (This can be done with a matrix)
 

Type:

Variant(s):

Version(s):

Number of the type-approval certificate including extension number ...
    - 1.2.2.1. Allowed Parameter Values for multistage type approval to use the base vehicle emission values (insert range where applicable) (1):
 

Final Vehicle mass in running order (in kg): ...

Frontal area for final vehicle (in cm<sup>2</sup>): ...

Rolling resistance (kg/t): ...

Cross-sectional area of air entrance of the front grille (in cm<sup>2</sup>): ...
    - 1.2.3. Identifiers (1):
      - 1.2.3.1. Interpolation family's identifier: ...
      - 1.2.3.2. ATCT family's identifier: ...
      - 1.2.3.3. PEMS family's identifier: ...
      - 1.2.3.4. Roadload family's identifier
        - 1.2.3.4.1. Roadload family of VH: ...
        - 1.2.3.4.2. Roadload family of VL: ...
        - 1.2.3.4.3. Roadload families applicable in the interpolation family: ...
        - 1.2.3.5. Roadload Matrix family's identifier: ...

- 1.2.3.6. Periodic regeneration family's identifier: ...
- 1.2.3.7. Evaporative test family's identifier: ...
- 1.2.3.8. OBD family's identifier: ...
- 1.2.3.9. Other family's identifier: ...
- 0.3. Means of identification of type, if marked on the vehicle/component/separate technical unit <sup>(1)</sup> <sup>(2)</sup>: ...
  - 1.3.1.1. Chassis: ...
  - 1.3.1.2. Bodywork/complete vehicle: ...
  - 1.3.1. Location of that marking: ...
    - 1.3.1.1. Chassis: ...
    - 1.3.1.2. Bodywork/complete vehicle: ...
- 1.4. Category of vehicle <sup>(3)</sup>: ...
  - 1.4.1. Classification(s) according to the dangerous goods which the vehicle is intended to transport: ...
- 1.5. Company name and address of manufacturer: ...
  - 1.5.1. For multi-stage approved vehicles, company name and address of the manufacturer of the base/previous stage(s) vehicle: ...
- 1.6. Location and method of attachment of statutory plates and location of vehicle identification number: ...
  - 1.6.1. On the chassis: ...
  - 1.6.2. On the bodywork: ...
- 1.7. (Not attributed)
- 1.8. Name(s) and address(es) of assembly plant(s): ...
- 1.9. Name and address of the manufacturer's representative (if any): ...
- 1. GENERAL CONSTRUCTION CHARACTERISTICS
  - 1.1. Photographs and/or drawings of a representative vehicle/component/separate technical unit <sup>(4)</sup>: ...
  - 1.2. Dimensional drawing of the whole vehicle (shortest and longest wheelbase if applicable): ...
  - 1.3. Number of axles: ... and wheels <sup>(5)</sup>: ...
    - 1.3.1. Number and position of axles with twin wheels: ...
    - 1.3.2. Number and position of steered axles: ...
    - 1.3.3. Powered axles (number, position, interconnection): ...

- 1.4. Chassis (if any) (overall drawing – shortest and longest wheelbase if applicable): ...
- 1.5. Material used for the side-members <sup>(6)</sup>: ...
- 1.6. Position and arrangement of the engine: ...
- 1.7. Driving cab: forward control <sup>(7)</sup>/bonneted/sleeper cab <sup>(4)</sup>: ...
- 1.8. Hand of drive: left/right <sup>(4)</sup>.
- 1.8.1. Vehicle is equipped to be driven in right/left <sup>(4)</sup> hand traffic.
- 1.9. Specify if the towing vehicle is intended to tow semi-trailers or other trailers and, if the trailer is a semi-, drawbar-, centre-axle- or rigid drawbar trailer: ...
- 1.10. Specify if the vehicle is specially designed for the controlled-temperature carriage of goods: ...
- 1.11. Specify if the vehicle is non-automated/automated/fully automated <sup>(4)</sup> <sup>(8)</sup>
2. **MASSES AND DIMENSIONS <sup>(9)</sup> <sup>(10)</sup> <sup>(11)</sup>**  
(in kg and mm) (Refer to drawing where applicable)
- 2.1. **Wheelbase(s) (fully loaded) <sup>(12)</sup>:**
  - 2.1.1. Two-axle vehicles: ...
  - 2.1.2. Vehicles with three or more axles
    - 2.1.2.1. Axle spacing between consecutive axles going from the foremost to the rearmost axle: ...
    - 2.1.2.2. Total axle spacing <sup>(13)</sup>: ...
- 2.2. **Fifth wheel**
  - 2.2.1. In the case of semi-trailers
    - 2.2.1.1. Distance between the axis of the fifth wheel kingpin and the rearmost end of the semi-trailer: ...
    - 2.2.1.2. Maximum distance between the axis of the fifth wheel kingpin and any point on the front of the semi-trailer: ...
    - 2.2.1.3. Semi-trailer special wheelbase (as defined in point 3.2 of Part D of Annex I to Commission Regulation (EU) No 1230/2012 <sup>(14)</sup>)
  - 2.2.2. In the case of semi-trailer towing vehicles
    - 2.2.2.1. Fifth wheel lead (maximum and minimum; indicate the permissible values in the case of an incomplete vehicle) <sup>(15)</sup>: ...
    - 2.2.2.2. Maximum height of the fifth wheel (standardised) <sup>(16)</sup>: ...
- 2.3. **Axle track(s) and width(s)**
  - 2.3.1. Track of each steered axle <sup>(17)</sup>: ...

- 2.3.2. Track of all other axles <sup>(17)</sup>: ...
- 2.3.3. Width of the widest rear axle (measured at the outermost part of the tyres excluding the bulging of the tyres close to the ground): ...
- 2.3.4. Width of the foremost axle (measured at the outermost part of the tyres excluding the bulging of the tyres close to the ground): ...
- 2.4. **Range of vehicle dimensions (overall)**
  - 2.4.1. For chassis without bodywork
    - 2.4.1.1. Length <sup>(18)</sup>: ...
      - 2.4.1.1.1. Maximum permissible length: ...
      - 2.4.1.1.2. Minimum permissible length: ...
      - 2.4.1.1.3. In the case of trailers, maximum permissible drawbar length <sup>(19)</sup>: ...
    - 2.4.1.2. Width <sup>(20)</sup>: ...
      - 2.4.1.2.1. Maximum permissible width: ...
      - 2.4.1.2.2. Minimum permissible width: ...
    - 2.4.1.3. Height (in running order) <sup>(21)</sup> (for suspensions adjustable for height, indicate normal running position): ...
      - 2.4.1.3.1. Maximum permissible height <sup>(22)</sup>: ...
    - 2.4.1.4. Front overhang <sup>(23)</sup>: ...
      - 2.4.1.4.1. Approach angle <sup>(24)</sup>: ..... degrees.
    - 2.4.1.5. Rear overhang <sup>(25)</sup>: ...
      - 2.4.1.5.1. Departure angle <sup>(26)</sup>: ..... degrees.
      - 2.4.1.5.2. Minimum and maximum permissible overhang of the coupling point <sup>(27)</sup>: ...
      - 2.4.1.5.3. Maximum permissible rear overhang <sup>(22)</sup>: ...
    - 2.4.1.6. Ground clearance (as defined in point 4.5 of Part A of Annex I to Regulation (EU) 2018/858)
      - 2.4.1.6.1. Between the axles: ...
      - 2.4.1.6.2. Under the front axle(s): ...
      - 2.4.1.6.3. Under the rear axle(s): ...
    - 2.4.1.7. Ramp angle <sup>(28)</sup>: ..... degrees.
    - 2.4.1.8. Extreme permissible positions of the centre of gravity of the body and/or interior fittings and/or equipment and/or payload: ...
  - 2.4.2. For chassis with bodywork
    - 2.4.2.1. Length <sup>(18)</sup>: ...

- 2.4.2.1.1. Length of the loading area: ...
- 2.4.2.1.2. In the case of trailers, maximum permissible drawbar length <sup>(28)</sup>: ...
- 2.4.2.1.3. Elongated cab complying with Article 9a of Council Directive 96/53/EC <sup>(29)</sup>: yes/no <sup>(4)</sup>
- 2.4.2.2. Width <sup>(20)</sup>: ...
  - 2.4.2.2.1. Thickness of the walls (in the case of vehicles designed for controlled-temperature carriage of goods): ...
- 2.4.2.3. Height (in running order) <sup>(21)</sup> (for suspensions adjustable for height, indicate normal running position): ...
- 2.4.2.4. Front overhang <sup>(23)</sup>: ...
  - 2.4.2.4.1. Approach angle <sup>(24)</sup>: ..... degrees.
- 2.4.2.5. Rear overhang <sup>(25)</sup>: ...
  - 2.4.2.5.1. Departure angle <sup>(26)</sup>: ..... degrees.
  - 2.4.2.5.2. Minimum and maximum permissible overhang of the coupling point <sup>(27)</sup>: ...
  - 2.4.2.5.3. Maximum permissible rear overhang: ...
- 2.4.2.6. Ground clearance (as defined in point 4.1 and 4.2 of Part A of Annex I to Regulation (EU) 2018/858)
  - 2.4.2.6.1. Between the axles: ...
  - 2.4.2.6.2. Under the front axle(s): ...
  - 2.4.2.6.3. Under the rear axle(s): ...
- 2.4.2.7. Ramp angle <sup>(28)</sup>: ..... degrees.
- 2.4.2.8. Extreme permissible positions of the centre of gravity of the payload (in the case of non-uniform load): ...
- 2.4.2.9. Position of centre of gravity of the vehicle (M2 and M3) at its technically permissible maximum laden mass in the longitudinal, transverse and vertical directions: ...
- 2.4.3. For bodywork approved without chassis (vehicles M2 and M3)
  - 2.4.3.1. Length <sup>(18)</sup>: ...
  - 2.4.3.2. Width <sup>(20)</sup>: ...
  - 2.4.3.3. Nominal height (in running order) <sup>(21)</sup> on intended chassis type(s) (for suspensions adjustable for height, indicate normal running position): ...
- 2.5. **Minimum mass on the steering axle(s) for incomplete vehicles: ...**
- 2.6. **Mass in running order <sup>(30)</sup>**
  - (a) Minimum and maximum for each variant: ...
  - (b) Mass of each version (a matrix must be provided): ...

- 2.6.1. Distribution of this mass among the axles and, in the case of a semi-trailer, a rigid drawbar trailer or a centre-axle trailer, the mass on the coupling:  
(a) Minimum and maximum for each variant: ...  
(b) Mass of each version (a matrix must be provided): ...
- 2.6.2. Maximum mass of the optional equipment (see the definition set out in point (5) of Article 2 of Commission Regulation (EU) No 1230/2012<sup>(31)</sup>): ...
- 2.6.2.1. Distribution of this mass among the axles and, in the case of a semi-trailer or centre-axle trailer, load on the coupling point: ...
- 2.6.3. Rotational mass<sup>(1)</sup>: 3 % of the sum of mass in running order and 25 kg or value, per axle (kg): ...
- 2.6.4. Additional mass for alternative propulsion: ...kg
- 2.6.5. List of equipment to for alternative propulsion (and indication of the mass of the parts): ...
- 2.7. **Minimum mass of the completed vehicle** as stated by the manufacturer, in the case of an incomplete vehicle: ...
- 2.7.1. Distribution of this mass among the axles and, in the case of a semi-trailer or centre-axle trailer, load on the coupling point: ...
- 2.7.2. Maximum permissible actual mass as stated by the manufacturer, in the case of in incomplete vehicle: ...
- 2.8. **Technically permissible maximum laden mass** stated by the manufacturer<sup>(32)</sup><sup>(33)</sup>: ...
- 2.8.1. Distribution of this mass among the axles and, in the case of a semi-trailer or centre-axle trailer, load on the coupling point<sup>(33)</sup>: ...
- 2.9. **Technically permissible maximum mass on each axle**: ...
- 2.10. **Technically permissible mass on each group of axles**: ...
- 2.11. **Technically permissible maximum towable mass of the towing vehicle**  
in case of:
- 2.11.1. Drawbar trailer: ...
- 2.11.2. Semi-trailer: ...
- 2.11.3. Centre-axle trailer: ...
- 2.11.3.1. Maximum ratio of the coupling overhang<sup>(34)</sup> to the wheel base: ...
- 2.11.3.2. Maximum V-value: ..... kN.
- 2.11.4. Rigid drawbar trailer: ...
- 2.11.5. Technically permissible maximum laden mass of the combination<sup>(33)</sup>: ...
- 2.11.6. Maximum mass of unbraked trailer: ...

- 2.12. **Technically permissible maximum mass at the coupling point:**
- 2.12.1. Of a towing vehicle: ...
- 2.12.2. Of a semi-trailer, a centre-axle trailer or a rigid drawbar trailer: ...
- 2.12.3. Maximum permissible mass of the coupling device (if not fitted by the manufacturer): ...
- 2.13. Rear swing-out (Point 8 of Part B/Point 7 of Part C of Annex I to Regulation (EU) No 1230/2012): ...
- 2.14. **Engine power/maximum mass ratio:** ..... kW/kg.
- 2.14.1. Engine power/technically permissible maximum laden mass of the combination ratio (Point 6 of Part B of Annex I to Regulation (EU) No 1230/2012): .....kW/kg.
- 2.15. **Hill-starting ability** (solo vehicle) <sup>(35)</sup>: ..... %.
- 2.16. **Registration/in service maximum permissible masses, vehicle categories M<sub>2</sub>, M<sub>3</sub>, N<sub>2</sub>, N<sub>3</sub>, O<sub>3</sub> and O<sub>4</sub> (optional)**
- 2.16.1. Registration/in service maximum permissible laden mass: ...
- 2.16.2. Registration/in service maximum permissible mass on each axle and, in the case of a semi-trailer or centre-axle trailer, intended load on the coupling point stated by the manufacturer if lower than the technically permissible maximum mass on the coupling point: ...
- 2.16.3. Registration/in service maximum permissible mass on each group of axles: ...
- 2.16.4. Intended registration/in service maximum permissible towable mass (several entries possible for each technical configuration) <sup>(101)</sup>: ...
- 2.16.5. Registration/in service maximum permissible mass of the combination: ...
- 2.17. **Vehicle submitted to multi-stage type-approval** (only in the case of incomplete or completed vehicles of category N1 within the scope of Regulation (EC) No 715/2007 of the European Parliament and of the Council <sup>(36)</sup>): yes/no <sup>(4)</sup>
- 2.17.1. Mass of the base vehicle in running order: ... kg.
- 2.17.2. Default added mass, calculated in accordance with Section 5 of Annex XII to Commission Regulation (EC) No 692/2008 <sup>(37)</sup>: ... kg.
3. PROPULSION ENERGY CONVERTER <sup>(38)</sup>
- 3.1. **Manufacturer of the propulsion energy converter(s):** ...
- 3.1.1. Manufacturer's code (as marked on the propulsion energy converter or other means of identification):  
...
- 3.1.2. Number of the approval certificate (where appropriate), including fuel identification marking: ...  
(heavy-duty vehicles only)
- 3.2. **Internal combustion engine**
- 3.2.1. Specific engine information

- 3.2.1.1. Working principle: positive ignition/compression ignition/dual- fuel <sup>(4)</sup>  
Cycle: four stroke/two stroke/rotary <sup>(4)</sup>
- 3.2.1.1.1. Type of dual-fuel engine: Type 1A/Type 1B/Type 2A/Type 2B/Type 3B <sup>(4)</sup> <sup>(42)</sup>
- 3.2.1.1.2. Gas energy ratio over the hot part of the WHTC test-cycle: ... %
- 3.2.1.2. Number and arrangement of cylinders: ...
- 3.2.1.2.1. Bore <sup>(39)</sup>: ..... mm
- 3.2.1.2.2. Stroke <sup>(39)</sup>: ..... mm
- 3.2.1.2.3. Firing order: ...
- 3.2.1.3. Engine capacity <sup>(40)</sup>: ..... cm<sup>3</sup>
- 3.2.1.4. Volumetric compression ratio <sup>(41)</sup>: ...
- 3.2.1.5. Drawings of combustion chamber, piston crown and, in the case of positive ignition engines, piston rings: ...
- 3.2.1.6. Normal engine idling speed <sup>(41)</sup>: ..... min<sup>-1</sup>
- 3.2.1.6.1. High engine idling speed <sup>(41)</sup>: ..... min<sup>-1</sup>
- 3.2.1.6.2. Idle on diesel: yes/no <sup>(4)</sup> <sup>(42)</sup>
- 3.2.1.7. Carbon monoxide content by volume in the exhaust gas with the engine idling <sup>(41)</sup>: ..... % as stated by the manufacturer (positive ignition engines only)
- 3.2.1.8. Maximum net power <sup>(43)</sup>: ... kW at ... min<sup>-1</sup> (manufacturer's declared value)
- 3.2.1.9. Maximum permitted engine speed as prescribed by the manufacturer: ... min<sup>-1</sup>
- 3.2.1.10. Maximum net torque <sup>(43)</sup>: ... Nm at ... min<sup>-1</sup> (manufacturer's declared value)
- 3.2.1.11. Manufacturer references of the documentation and extended documentation packages required by Articles 5, 7 and 9 of Commission Regulation (EU) No 582/2011 <sup>(44)</sup> or by Articles 3 and 5 of Commission Regulation (EU) 2017/1151 enabling the approval authority to evaluate the emission control strategies and the systems on-board the engine or vehicle to ensure the correct operation of emissions control measures.
- 3.2.2. Fuel
- 3.2.2.1. Diesel/Petrol/LPG/NG or Biomethane/Ethanol (E 85)/Biodiesel/Hydrogen <sup>(4)</sup> <sup>(45)</sup>
- 3.2.2.1.1. RON, unleaded: ...
- 3.2.2.2. Heavy duty vehicles Diesel/Petrol/LPG/NG-H/NG-L/NG-HL/Ethanol (ED95)/Ethanol (E85)/LNG/LNG<sub>20</sub> <sup>(4)</sup> <sup>(45)</sup>
- 3.2.2.2.1. (Euro VI only) Fuels compatible with use by the engine declared by the manufacturer in accordance with point 1.1.2 of Annex I to Regulation (EU) No 582/2011 (as applicable)



- 3.2.2.3. Fuel tank inlet: restricted orifice/label <sup>(4)</sup>
- 3.2.2.4. Vehicle fuel type: Mono fuel, Bi fuel, Flex fuel, Dual fuel Type 1A/Type 1B/Type 2A/Type 2B/Type 3B <sup>(4)</sup>
- 3.2.2.5. Maximum amount of biofuel acceptable in fuel (manufacturer's declared value): ... % by volume
- 3.2.3. Fuel tank(s)
- 3.2.3.1. Service fuel tank(s)
- 3.2.3.1.1. Number and capacity of each tank: ...
- 3.2.3.1.1.1. Material: ...
- 3.2.3.1.2. Drawing and technical description of the tank(s) with all connections and all lines of the breathing and venting system, locks, valves, fastening devices: ...
- 3.2.3.1.3. Drawing clearly showing the position of the tank(s) in the vehicle: ...
- 3.2.3.2. Reserve fuel tank(s)
- 3.2.3.2.1. Number and capacity of each tank: ...
- 3.2.3.2.1.1. Material: ...
- 3.2.3.2.2. Drawing and technical description of the tank(s) with all connections and all lines of the breathing and venting system, locks, valves, fastening devices: ...
- 3.2.3.2.3. Drawing clearly showing the position of the tank(s) in the vehicle: ...
- 3.2.4. Fuel feed
- 3.2.4.1. By carburettor(s): yes/no <sup>(4)</sup>
- 3.2.4.2. By fuel injection (compression ignition or dual-fuel only): yes/no <sup>(4)</sup>
- 3.2.4.2.1. System description (common rail/unit injectors/distribution pump etc.): ...
- 3.2.4.2.2. Working principle: direct injection/pre-chamber/swirl chamber <sup>(4)</sup>
- 3.2.4.2.3. Injection/Delivery pump
- 3.2.4.2.3.1. Make(s): ...
- 3.2.4.2.3.2. Type(s): ...
- 3.2.4.2.3.3. Maximum fuel delivery <sup>(4)</sup> <sup>(41)</sup>: ... mm<sup>3</sup>/stroke or cycle at an engine speed of: ... min<sup>-1</sup> or, alternatively, a characteristic diagram: ...  
(When boost control is supplied, state the characteristic fuel delivery and boost pressure versus engine speed)
- 3.2.4.2.3.4. Static injection timing <sup>(41)</sup>: ...
- 3.2.4.2.3.5. Injection advance curve <sup>(41)</sup>: ...
- 3.2.4.2.3.6. Calibration procedure: test bench/engine <sup>(4)</sup>

- 3.2.4.2.4. Engine speed limitation control
  - 3.2.4.2.4.1. Type: ...
  - 3.2.4.2.4.2. Cut-off point
    - 3.2.4.2.4.2.1. Speed at which cut-off starts under load: ..... min<sup>-1</sup>
    - 3.2.4.2.4.2.2. Maximum no-load speed: ..... min<sup>-1</sup>
    - 3.2.4.2.4.2.3. Idling speed: ..... min<sup>-1</sup>
  - 3.2.4.2.5. Injection piping (heavy-duty vehicles only)
    - 3.2.4.2.5.1. Length: ..... mm
    - 3.2.4.2.5.2. Internal diameter: ..... mm
    - 3.2.4.2.5.3. Common rail, make and type: ...
  - 3.2.4.2.6. Injector(s)
    - 3.2.4.2.6.1. Make(s): ...
    - 3.2.4.2.6.2. Type(s): ...
    - 3.2.4.2.6.3. Opening pressure <sup>(41)</sup>: ... kPa or characteristic diagram <sup>(41)</sup>: ...
  - 3.2.4.2.7. Cold start system
    - 3.2.4.2.7.1. Make(s): ...
    - 3.2.4.2.7.2. Type(s): ...
    - 3.2.4.2.7.3. Description: ...
  - 3.2.4.2.8. Auxiliary starting aid
    - 3.2.4.2.8.1. Make(s): ...
    - 3.2.4.2.8.2. Type(s): ...
    - 3.2.4.2.8.3. System description: ...
  - 3.2.4.2.9. Electronic controlled injection: yes/no <sup>(4)</sup>
    - 3.2.4.2.9.1. Make(s): ...
    - 3.2.4.2.9.2. Type(s):
    - 3.2.4.2.9.3. Description of the system
      - 3.2.4.2.9.3.1. Make and type of the control unit (ECU): ...
        - 3.2.4.2.9.3.1.1. Software identification number of the ECU: ...

- 3.2.4.2.9.3.2. Make and type of the fuel regulator: ...
- 3.2.4.2.9.3.3. Make and type of the air-flow sensor: ...
- 3.2.4.2.9.3.4. Make and type of fuel distributor: ...
- 3.2.4.2.9.3.5. Make and type of the throttle housing: ...
- 3.2.4.2.9.3.6. Make and type of water temperature sensor: ...
- 3.2.4.2.9.3.7. Make and type of air temperature sensor: ...
- 3.2.4.2.9.3.8. Make and type of air pressure sensor: ...
- 3.2.4.3. By fuel injection (positive ignition only): yes/no <sup>(4)</sup>
- 3.2.4.3.1. Working principle: intake manifold (single-/multi-point/direct injection <sup>(4)</sup>/other (specify): ...
- 3.2.4.3.2. Make(s): ...
- 3.2.4.3.3. Type(s): ...
- 3.2.4.3.4. System description (In the case of systems other than continuous injection give equivalent details): ...
- 3.2.4.3.4.1. Make and type of the control unit (ECU): ...
- 3.2.4.3.4.1.1. Software identification number of the ECU: ...
- 3.2.4.3.4.2. Make and type of fuel regulator: ...
- 3.2.4.3.4.3. Make and type or working principle of air-flow sensor: ...
- 3.2.4.3.4.4. Make and type of fuel distributor: ...
- 3.2.4.3.4.5. Make and type of pressure regulator: ...
- 3.2.4.3.4.6. Make and type of micro switch: ...
- 3.2.4.3.4.7. Make and type of idling adjustment screw: ...
- 3.2.4.3.4.8. Make and type of throttle housing: ...
- 3.2.4.3.4.9. Make and type water temperature sensor: ...
- 3.2.4.3.4.10. Make and type air temperature sensor: ...
- 3.2.4.3.4.11. Make and type air pressure sensor: ...
- 3.2.4.3.4.12. Software identification number(s): ...
- 3.2.4.3.5. Injectors
- 3.2.4.3.5.1. Make and type: ...

- 3.2.4.3.6. Injection timing: ...
- 3.2.4.3.7. Cold start system
  - 3.2.4.3.7.1. Operating principle(s): ...
  - 3.2.4.3.7.2. Operating limits/settings <sup>(4)</sup> <sup>(41)</sup>: ...
- 3.2.4.4. Feed pump
  - 3.2.4.4.1. Pressure <sup>(41)</sup>: ... kPa or characteristic diagram<sup>(41)</sup>: ...
  - 3.2.4.4.2. Make(s): ....
  - 3.2.4.4.3. Type(s): ...
- 3.2.5. Electrical system
  - 3.2.5.1. Rated voltage: ..... V, positive/negative ground <sup>(41)</sup>
  - 3.2.5.2. Generator
    - 3.2.5.2.1. Make and type: ...
    - 3.2.5.2.2. Nominal output: ..... VA
- 3.2.6. Ignition system (spark ignition engines only)
  - 3.2.6.1. Make(s): ...
  - 3.2.6.2. Type(s): ...
  - 3.2.6.3. Working principle: ...
  - 3.2.6.4. Ignition advance curve or map <sup>(41)</sup>: ...
  - 3.2.6.5. Static ignition timing <sup>(41)</sup>: ..... degrees before TDC
  - 3.2.6.6. Spark plugs
    - 3.2.6.6.1. Make: ...
    - 3.2.6.6.2. Type: ...
    - 3.2.6.6.3. Gap setting: .....mm
  - 3.2.6.7. Ignition coil(s)
    - 3.2.6.7.1. Make: ...
    - 3.2.6.7.2. Type: ...
- 3.2.7. Cooling system: liquid/air <sup>(4)</sup>
  - 3.2.7.1. Nominal setting of the engine temperature control mechanism: ...

- 3.2.7.2. Liquid
  - 3.2.7.2.1. Nature of liquid: ...
  - 3.2.7.2.2. Circulating pump(s): yes/no (\*)
  - 3.2.7.2.3. Characteristics: ..... or
    - 3.2.7.2.3.1. Make(s): ...
    - 3.2.7.2.3.2. Type(s): ...
  - 3.2.7.2.4. Drive ratio(s): ...
  - 3.2.7.2.5. Description of the fan and its drive mechanism: ...
- 3.2.7.3. Air
  - 3.2.7.3.1. Fan: yes/no (\*)
  - 3.2.7.3.2. Characteristics: ..... Or
    - 3.2.7.3.2.1. Make(s): ...
    - 3.2.7.3.2.2. Type(s): ...
  - 3.2.7.3.3. Drive ratio(s): ...
- 3.2.8. Intake system
  - 3.2.8.1. Pressure charger: yes/no (\*)
    - 3.2.8.1.1. Make(s): ...
    - 3.2.8.1.2. Type(s): ...
    - 3.2.8.1.3. Description of the system (e.g. maximum charge pressure: ..... kPa; wastegate if applicable): ...
  - 3.2.8.2. Intercooler: yes/no (\*)
    - 3.2.8.2.1. Type: air-air/air-water (\*)
  - 3.2.8.3. Intake depression at rated engine speed and at 100 % load (compression ignition engines only)
    - 3.2.8.3.1. Minimum allowable: ..... kPa
    - 3.2.8.3.2. Maximum allowable: ..... kPa
    - 3.2.8.3.3. (Euro VI only) Actual Intake system depression at rated engine speed and at 100 % load on the vehicle: kPa
  - 3.2.8.4. Description and drawings of inlet pipes and their accessories (plenum chamber, heating device, additional air intakes, etc.): ...
    - 3.2.8.4.1. Intake manifold description (include drawings and/or photos): ...

- 3.2.8.4.2. Air filter, drawings: ...
  - 3.2.8.4.2.1. Make(s): ...
  - 3.2.8.4.2.2. Type(s): ...
- 3.2.8.4.3. Intake silencer, drawings: ...
  - 3.2.8.4.3.1. Make(s): ...
  - 3.2.8.4.3.2. Type(s): ...
- 3.2.9. Exhaust system
  - 3.2.9.1. Description and drawing of the exhaust manifold: ...
  - 3.2.9.2. Description and drawing of the exhaust system: ...
    - 3.2.9.2.1. (Euro VI only) Description and/or drawing of the elements of the exhaust system that are part of the engine system
  - 3.2.9.3. Maximum allowable exhaust back pressure at rated engine speed and at 100 % load (compression ignition engines only): ..... kPa
    - 3.2.9.3.1. (Euro VI only) Actual exhaust backpressure at rated engine speed and at 100 % load on the vehicle (compression-ignition engines only): ... kPa
  - 3.2.9.4. Make(s) and type(s) of exhaust silencer(s): ...  
If applicable relevant for exterior noise, reducing measures in the engine compartment and on the engine: ...
  - 3.2.9.5. Location of the exhaust outlet: ...
  - 3.2.9.6. Exhaust silencer containing fibrous materials: ...
    - 3.2.9.6.1. Description of the location and type of fibrous materials used: ...
  - 3.2.9.7. Complete exhaust system volume: ... dm<sup>3</sup>
    - 3.2.9.7.1. (Euro VI only) Acceptable exhaust system volume: ... dm<sup>3</sup>
    - 3.2.9.7.2. (EURO VI only) Volume of the exhaust system that is part of the engine system: ... dm<sup>3</sup>
  - 3.2.10. Minimum cross-sectional areas of inlet and outlet ports: ...
  - 3.2.11. Valve timing or equivalent data
    - 3.2.11.1. Maximum lift of valves, angles of opening and closing, or timing details of alternative distribution systems, in relation to dead centres. For variable timing system, minimum and maximum timing: ...
    - 3.2.11.2. Reference and/or setting ranges (4): ...
  - 3.2.12. Measures taken against air pollution
    - 3.2.12.1. Emission character of type approval (1)

- 3.2.12.2. Device for recycling crankcase gases (description and drawings): ...
- 3.2.12.2.1. (Euro VI only) Device for recycling crankcase gases: yes/no <sup>(4)</sup>
  - If yes, description and drawings:
  - If no, compliance with Annex V to Regulation (EU) No 582/2011 required
- 3.2.12.3. Pollution control devices (if not covered by another heading)
- 3.2.12.2.1. Catalytic converter
  - 3.2.12.2.1.1. Number of catalytic converters and elements (provide the information below for each separate unit): ...
  - 3.2.12.2.1.2. Dimensions, shape and volume of the catalytic converter(s): ...
  - 3.2.12.2.1.3. Type of catalytic action: ... (oxidising, three-way, lean NO<sub>x</sub> trap, SCR, lean NO<sub>x</sub> catalyst or other)
  - 3.2.12.2.1.4. Total charge of precious metals: ...
  - 3.2.12.2.1.5. Relative concentration: ...
  - 3.2.12.2.1.6. Substrate (structure and material): ...
  - 3.2.12.2.1.7. Cell density: ...
  - 3.2.12.2.1.8. Type of casing for the catalytic converter(s): ...
  - 3.2.12.2.1.9. Location of the catalytic converter(s) (place and reference distance in the exhaust line): ...
  - 3.2.12.2.1.10. Heat shield: yes/no <sup>(4)</sup>
  - 3.2.12.2.1.11. Normal operating temperature range: ... °C
  - 3.2.12.2.1.12. Make of catalytic converter: ...
  - 3.2.12.2.1.13. Identifying part number: ...
- 3.2.12.2.2. Sensors
  - 3.2.12.2.2.1. Oxygen sensor: yes/no <sup>(4)</sup>
    - 3.2.12.2.2.1.1. Make and type: ...
    - 3.2.12.2.2.1.2. Location: ...
    - 3.2.12.2.2.1.3. Control range: ....
    - 3.2.12.2.2.1.4. Type or working principle: ...
    - 3.2.12.2.2.1.5. Identifying part number: ...
  - 3.2.12.2.2.2. NO<sub>x</sub> sensor: yes/no <sup>(4)</sup>
    - 3.2.12.2.2.2.1. Make: ...

- 3.2.12.2.2.2.2. Type: ...
- 3.2.12.2.2.2.3. Location: ...
- 3.2.12.2.2.3. Particulate sensor: yes/no<sup>(4)</sup>
- 3.2.12.2.2.3.1. Make: ...
- 3.2.12.2.2.3.2. Type: ...
- 3.2.12.2.2.3.3. Location: ...
- 3.2.12.2.3. Air injection: yes/no<sup>(4)</sup>
- 3.2.12.2.3.1. Type (pulse air, air pump, etc.): ...
- 3.2.12.2.4. Exhaust gas recirculation (EGR): yes/no<sup>(4)</sup>
- 3.2.12.2.4.1. Characteristics (make, type, flow, high pressure/low pressure/combined pressure, etc.): ...
- 3.2.12.2.4.2. Water-cooled system (to be specified for each EGR system e.g. low pressure/high pressure/combined pressure: yes/no<sup>(4)</sup>)
- 3.2.12.2.5. Evaporative emissions control system (petrol and ethanol engines only): yes/no<sup>(4)</sup>
- 3.2.12.2.5.1. Detailed description of the devices: ....
- 3.2.12.2.5.2. Drawing of the evaporative control system: ...
- 3.2.12.2.5.3. Drawing of the carbon canister: ...
- 3.2.12.2.5.3.1. Make and type of the carbon canister: ...
- 3.2.12.2.5.4. Mass of dry charcoal: ... g
- 3.2.12.2.5.4.1. Type of dry charcoal: ...
- 3.2.12.2.5.5. Schematic drawing of the fuel tank (petrol and ethanol engines only): ...
- 3.2.12.2.5.5.1. Fuel tank system capacity, material and construction: ...
- 3.2.12.2.5.5.2. Description of vapour hose material, fuel line material and connection technique of the fuel system: ...
- 3.2.12.2.5.5.3. Sealed tank system: yes/no<sup>(4)</sup>
- 3.2.12.2.5.5.4. Description of fuel tank relief valve setting (air ingestion and relief): ...
- 3.2.12.2.5.5.5. Description of the purge control system: ...
- 3.2.12.2.5.6. Description and schematic of the heat shield between tank and exhaust system: ...
- 3.2.12.2.5.7. Permeability factor: ...



- 3.2.12.2.6. Particulate trap (PT): yes/no<sup>(4)</sup>
- 3.2.12.2.6.1. Dimensions, shape and capacity of the particulate trap: ...
- 3.2.12.2.6.2. Design of the particulate trap: ...
- 3.2.12.2.6.3. Location (reference distance in the exhaust line): ...
- 3.2.12.2.6.4. Make of particulate trap: ...
- 3.2.12.2.6.5. Identifying part number: ...
- 3.2.12.2.6.7. Normal operating temperature: ... (K) and pressure range ... (KPa)  
(heavy-duty vehicles only)
- 3.2.12.2.6.8. In the case of periodic regeneration (heavy-duty vehicles only)
- 3.2.12.2.6.8.1. Number of ETC test cycles between 2 regenerations (n1): ... (not applicable to Euro VI)
- 3.2.12.2.6.8.1.1. (Euro VI only) Number of WHTC test cycles without regeneration (n): 3.2.12.2.6.8.2.  
Number of ETC cycles during regeneration (n2): ... (not applicable to Euro VI)
- 3.2.12.2.6.8.2.1. (Euro VI only) Number of WHTC test cycles with regeneration (n<sub>R</sub>):
- 3.2.12.2.6.9. Other systems: yes/no<sup>(4)</sup>
- 3.2.12.2.6.9.1. Description and operation
- 3.2.12.2.7. On-board-diagnostic (OBD) system: yes/no<sup>(4)</sup>: ...
- 3.2.12.2.7.0.1. (Euro VI only) Number of OBD engine families within the engine family
- 3.2.12.2.7.0.2. (Euro VI only) List of the OBD engine families (when applicable)
- 3.2.12.2.7.1.3. (Euro VI only) Number of the OBD engine family the parent engine/the engine member belongs to: ...
- 3.2.12.2.7.1.4. (Euro VI only) Manufacturer references of the OBD-Documentation required by Article 5(4)(c) and Article 9(4) of Regulation (EU) No 582/2011 and specified in Annex X to that Regulation for the purpose of approving the OBD system
- 3.2.12.2.7.1.5. (Euro VI only) When appropriate, manufacturer reference of the Documentation for installing in a vehicle an OBD equipped engine system
- 3.2.12.2.7.1.6. (Euro VI only) When appropriate, manufacturer reference of the documentation package related to the installation on the vehicle of the OBD system of an approved engine
- 3.2.12.2.7.1.7. Written description and/or drawing of the MI<sup>(46)</sup>: ...
- 3.2.12.2.7.1.8. Written description and/or drawing of the OBD off-board communication interface<sup>(46)</sup>
- 3.2.12.2.7.1. Written description and/or drawing of the MI: ...
- 3.2.12.2.7.2. List and purpose of all components monitored by the OBD system: ...

- 3.2.12.2.7.3. Written description (general working principles) for
- 3.2.12.2.7.3.1. Positive-ignition engines
- 3.2.12.2.7.3.1.1. Catalyst monitoring: ...
- 3.2.12.2.7.3.1.2. Misfire detection: ...
- 3.2.12.2.7.3.1.3. Oxygen sensor monitoring: ...
- 3.2.12.2.7.3.1.4. Particulate trap monitoring: ...
- 3.2.12.2.7.3.1.5. Other components monitored by the OBD system: ...
- 3.2.12.2.7.3.2. Compression-ignition engines: ...
- 3.2.12.2.7.3.2.1. Catalyst monitoring: ...
- 3.2.12.2.7.3.2.2. Particulate trap monitoring: ...
- 3.2.12.2.7.3.2.3. Electronic fuelling system monitoring: ...
- 3.2.12.2.7.3.2.4. DeNO<sub>x</sub> system monitoring: ...
- 3.2.12.2.7.3.2.5. Other components monitored by the OBD system: ...
- 3.2.12.2.7.4. Criteria for MI activation (fixed number of driving cycles or statistical method): ...
- 3.2.12.2.7.5. List of all OBD output codes and formats used (with explanation of each): ...
- 3.2.12.2.7.6. The following additional information shall be provided by the vehicle manufacturer for the purposes of enabling the manufacture of OBD-compatible replacement or service parts and diagnostic tools and test equipment.
- 3.2.12.2.7.6.1. A description of the type and number of the preconditioning cycles used for the original type approval of the vehicle.
- 3.2.12.2.7.6.2. A description of the type of the OBD demonstration cycle used for the original type-approval of the vehicle for the component monitored by the OBD system.
- 3.2.12.2.7.6.3. A comprehensive document describing all sensed components with the strategy for fault detection and MI activation (fixed number of driving cycles or statistical method), including a list of relevant secondary sensed parameters for each component monitored by the OBD system. A list of all OBD output codes and format used (with an explanation of each) associated with individual emission related power-train components and individual non-emission related components, where monitoring of the component is used to determine MI activation, including in particular a comprehensive explanation for the data given in service \$05 Test ID \$21 to FF and the data given in service \$06.
- In the case of vehicle types that use a communication link in accordance with ISO 15765-4:2016 'Road vehicles, diagnostics on controller area network (CAN) – Part 4: requirements for emissions-related systems', a comprehensive explanation for the data given in service \$06 Test ID \$00 to FF, for each OBD monitor ID supported, shall be provided.

3.2.12.2.7.6.4. The information required above may be defined by completing a table as described below.

3.2.12.2.7.6.4.1. Light-duty vehicles

Component	Fault code	Monitoring strategy	Fault detection criteria	MI activation criteria	Secondary parameters	Preconditioning	Demonstration test
Catalyst	P0420	Oxygen sensor 1 and sensor 2 signals	Difference between sensor 1 and sensor 2 signals-	3rd cycle	Engine speed, engine load, A/F mode, catalyst temperature	Two type I cycles	Type I

3.2.12.2.7.6.4.2. Heavy-duty vehicles

Component	Fault code	Monitoring strategy	Fault detection criteria	MI activation criteria	Secondary parameters	preconditioning	Demonstration test
SCR Catalyst	Pxxx	NO <sub>x</sub> sensor 1 and sensor 2 signals	Difference between sensor 1 and sensor 2 signals-	3rd cycle	Engine speed, engine load, catalyst temperature, reagent activity	Three OBD test cycles (3 short ESC cycles)	OBD test cycle (short ESC cycle)

3.2.12.2.7.6.5. (Euro VI only) OBD Communication protocol standard <sup>(47)</sup>:

3.2.12.2.7.7. (Euro VI only) Manufacturer reference of the OBD related information required by of Article 5(4)(d) and Article 9(4) of Regulation (EU) No 582/2011 for the purpose of complying with the provisions on access to vehicle OBD and vehicle Repair and Maintenance Information, or

3.2.12.2.7.7.1. As an alternative to the manufacturer reference provided in point 3.2.12.2.7.7., reference of the attachment to the information document set out in Appendix 4 of Annex I to Regulation (EU) No 582/2011 shall contains a table in accordance with the following example:

Component – Fault code – Monitoring strategy – Fault detection criteria – MI activation criteria – Secondary parameters – Preconditioning – Demonstration test

Catalyst – P0420 – Oxygen sensor 1 and 2 signals – Difference between sensor 1 and sensor 2 signals – 3rd cycle – Engine speed, engine load, A/F mode, catalyst temperature – Two Type 1 cycles – Type 1

3.2.12.2.7.8. (EURO VI only) OBD components on-board the vehicle

3.2.12.2.7.8.1. Alternative approval as provided for in point 2.4.1 of Annex X to Regulation (EU) No 582/2011: yes/no <sup>(4)</sup>

3.2.12.2.7.8.2. List of OBD components on-board the vehicle

- 3.2.12.2.7.8.3. Written description and/or drawing of the MI<sup>(48)</sup>
- 3.2.12.2.7.8.4. Written description and/or drawing of the OBD off-board communication interface<sup>(48)</sup>
- 3.2.12.2.8. Other system: ...
- 3.2.12.2.8.1. (Euro VI only) Systems to ensure the correct operation of NO<sub>x</sub> control measures
- 3.2.12.2.8.2. Driver inducement system
- 3.2.12.2.8.2.1. (Euro VI only) Engine with permanent deactivation of the driver inducement, for use by the rescue services or in vehicles specified in point (d) of Article 2(2) to Regulation (EU) 2018/858: yes/no<sup>(4)</sup>
- 3.2.12.2.8.2.2. Activation of the creep mode  
'disable after restart'/'disable after fuelling'/'disable after parking'<sup>(4)</sup><sup>(49)</sup>
- 3.2.12.2.8.2.3. Type of inducement system: no engine restart after countdown/no start after refuelling/fuel-lockout/performance restriction
- 3.2.12.2.8.2.4. Description of the inducement system
- 3.2.12.2.8.2.5. Equivalent to the average driving range of the vehicle with a complete tank of fuel: ... km
- 3.2.12.2.8.3. (Euro VI only) Number of OBD engine families within the engine family considered when ensuring the correct operation of NO<sub>x</sub> control measures
- 3.2.12.2.8.3.1. (Euro VI only) List of the OBD engine families within the engine family considered when ensuring the correct operation of NO<sub>x</sub> control measures (when applicable)
- 3.2.12.2.8.3.2. (Euro VI only) Number of the OBD engine family the parent engine/the engine member belongs to
- 3.2.12.2.8.4. (Euro VI only) List of the OBD engine families (when applicable): ...
- 3.2.12.2.8.5. (Euro VI only) Number of the OBD engine family the parent engine/the engine member belongs to
- 3.2.12.2.8.6. (Euro VI only) lowest concentration of the active ingredient present in the reagent that does not activate the warning system (CD<sub>min</sub>): (% vol.)
- 3.2.12.2.8.7. (Euro VI only) When appropriate, manufacturer reference of the Documentation for installing in a vehicle the systems to ensure the correct operation of NO<sub>x</sub> control measures
- 3.2.12.2.8.8. (EURO VI only) Components on-board the vehicle of the systems ensuring the correct operation of NO<sub>x</sub> control measures
- 3.2.12.2.8.8.1. List of components on-board the vehicle of the systems ensuring the correct operation of NO<sub>x</sub> control measures
- 3.2.12.2.8.8.2. When appropriate, manufacturer reference of the documentation package related to the installation on the vehicle of the system ensuring the correct operation of NO<sub>x</sub> control measures of an approved engine
- 3.2.12.2.8.8.3. Written description and/or drawing of the warning signal<sup>(48)</sup>
- 3.2.12.2.8.8.4. Alternative approval provided for in point 2.1 of Annex XIII to Regulation (EU) No 582/2011: yes/no<sup>(4)</sup>

- 3.2.12.2.8.8.5. Heated/non-heated reagent tank and dosing system (see paragraph 2.4 of Annex 11 to UN Regulation No 49 of the Economic Commission for Europe of the United Nations (UN/ECE) <sup>(50)</sup>)
- 3.2.12.2.9. Torque limiter: yes/no <sup>(4)</sup>
- 3.2.12.2.9.1. Description of the torque limiter activation (heavy-duty vehicles only): ...
- 3.2.12.2.9.2. Description of the full load curve limitation (heavy-duty vehicles only): ...
- 3.2.12.2.10. Periodically regenerating system: (provide the information below for each separate unit)
- 3.2.12.2.10.1. Method or system of regeneration, description and/or drawing: ...
- 3.2.12.2.10.2. The number of Type 1 operating cycles, or equivalent engine test bench cycles, between two cycles where regenerative phases occur under the conditions equivalent to Type 1 test (Distance 'D' in Figure A6.App1/1 in Appendix 1 to Sub-Annex 6 of Annex XXI to Commission Regulation (EU) 2017/1151 <sup>(51)</sup> or figure A13/1 in Annex 13 to UN Regulation No 83 of the Economic Commission for Europe of the United Nations (UNECE) <sup>(52)</sup> (as applicable): ...
- 3.2.12.2.10.2.1. Applicable Type 1 cycle (indicate the applicable procedure: Regulation (EU) 2017/1151 Annex XXI, Sub-Annex 4 or UN Regulation No 83): ...
- 3.2.12.2.10.3. Description of method employed to determine the number of cycles between two cycles where regenerative phases occur: ...
- 3.2.12.2.10.4. Parameters to determine the level of loading required before regeneration occurs (i.e. temperature, pressure etc.): ...
- 3.2.12.2.10.5. Description of method used to load system in the test procedure described in paragraph 3.1., Annex 13 to UN Regulation No 83: ...
- 3.2.12.2.11. Catalytic converter systems using consumable reagents (provide the information below for each separate unit) yes/no <sup>(4)</sup>
- 3.2.12.2.11.1. Type and concentration of reagent needed: ...
- 3.2.12.2.11.2. Normal operational temperature range of reagent: ...
- 3.2.12.2.11.3. International standard: ...
- 3.2.12.2.11.4. Frequency of reagent refill: continuous/maintenance (where appropriate):
- 3.2.12.2.11.5. Reagent indicator (description and location): ...
- 3.2.12.2.11.6. Reagent tank
- 3.2.12.2.11.6.1. Capacity: ...
- 3.2.12.2.11.6.2. Heating system: yes/no <sup>(4)</sup>
- 3.2.12.2.11.6.2.1. Description or drawing: ...
- 3.2.12.2.11.7. Reagent control unit: yes/no <sup>(4)</sup>
- 3.2.12.2.11.7.1. Make: ...

- 3.2.12.2.11.7.2. Type: ...
- 3.2.12.2.11.8. Reagent injector (make type and location): ...
- 3.2.12.2.12. Water injection: yes/no (\*)
- 3.2.13. Smoke opacity
- 3.2.13.1. Location of the absorption coefficient symbol (compression ignition engines only): ...
- 3.2.13.2. Power at six points of measurement (see Appendix 2 of Annex IV to Regulation (EC) No 692/2008)
- 3.2.13.3. Engine power measured on test bench/on the vehicle
- 3.2.13.3.1. Declared speeds and powers

Measurement points	Engine speed (min <sup>-1</sup> )	Power (kW)
1.....		
2.....		
3.....		
4.....		
5.....		
6.....		

- 3.2.14. Details of any devices designed to influence fuel economy (if not covered by other items): ...
- 3.2.15. LPG fuelling system: yes/no (\*)
- 3.2.15.1. The number of the type-approval certificate issued in accordance with Annex IV to this Regulation or UN Regulation No 67 of the Economic Commission for Europe of the United Nations (UNECE) <sup>(53)</sup>: ...
- 3.2.15.2. Electronic engine management control unit for LPG fuelling
- 3.2.15.2.1. Make(s): ...
- 3.2.15.2.2. Type(s): ...
- 3.2.15.2.3. Emission-related adjustment possibilities: ...
- 3.2.15.3. Further documentation
- 3.2.15.3.1. Description of the safeguarding of the catalyst at switch-over from petrol to LPG or back: ...
- 3.2.15.3.2. System layout (electrical connections, vacuum connections compensation hoses, etc.): ...
- 3.2.15.3.3. Drawing of the symbol: ...
- 3.2.16. NG fuelling system: yes/no (\*)
- 3.2.16.1. The number of the type-approval certificate issued in accordance with Annex IV to this Regulation or UN Regulation No 110 of the Economic Commission for Europe of the United Nations (UNECE) <sup>(54)</sup>: ...

- 3.2.16.2. Electronic engine management control unit for NG fuelling
  - 3.2.16.2.1. Make(s): ...
  - 3.2.16.2.2. Type(s): ...
  - 3.2.16.2.3. Emission-related adjustment possibilities: ...
- 3.2.16.3. Further documentation
  - 3.2.16.3.1. Description of the safeguarding of the catalyst at switch-over from petrol to NG or back: ...
  - 3.2.16.3.2. System layout (electrical connections, vacuum connections compensation hoses, etc.): ...
  - 3.2.16.3.3. Drawing of the symbol: ...
- 3.2.17. Specific information related to gas and dual-fuel engines for heavy-duty vehicles (in the case of systems laid out in a different manner, supply equivalent information) (if applicable)
  - 3.2.17.1. Fuel: LPG/NG-H/NG-L/NG-HL <sup>(4)</sup>
  - 3.2.17.2. Pressure regulator(s) or vaporiser/pressure regulator(s) <sup>(4)</sup>
    - 3.2.17.2.1. Make(s): ...
    - 3.2.17.2.2. Type(s): ...
    - 3.2.17.2.3. Number of pressure reduction stages: ...
    - 3.2.17.2.4. Pressure in final stage minimum: ..... kPa – maximum: ..... kPa
    - 3.2.17.2.5. Number of main adjustment points: ...
    - 3.2.17.2.6. Number of idle adjustment points: ...
    - 3.2.17.2.7. Number of the type-approval certificate: ...
  - 3.2.17.3. Fuelling system: mixing unit/gas injection/liquid injection/direct injection <sup>(4)</sup>
    - 3.2.17.3.1. Mixture strength regulation: ...
    - 3.2.17.3.2. System description and/or diagram and drawings: ...
    - 3.2.17.3.3. Number of the type-approval certificate: ...
  - 3.2.17.4. Mixing unit
    - 3.2.17.4.1. Number: ...
    - 3.2.17.4.2. Make(s): ...
    - 3.2.17.4.3. Type(s): ...
    - 3.2.17.4.4. Location: ...
    - 3.2.17.4.5. Adjustment possibilities: ...

- 3.2.17.4.6. Number of the type-approval certificate: ...
- 3.2.17.5. Inlet manifold injection
  - 3.2.17.5.1. Injection: single point/multipoint <sup>(4)</sup>
  - 3.2.17.5.2. Injection: continuous/simultaneously timed/sequentially timed <sup>(4)</sup>
  - 3.2.17.5.3. Injection equipment
    - 3.2.17.5.3.1. Make(s): ...
    - 3.2.17.5.3.2. Type(s): ...
    - 3.2.17.5.3.3. Adjustment possibilities: ...
    - 3.2.17.5.3.4. Number of the type-approval certificate: ...
  - 3.2.17.5.4. Supply pump (if applicable)
    - 3.2.17.5.4.1. Make(s): ...
    - 3.2.17.5.4.2. Type(s): ...
    - 3.2.17.5.4.3. Number of the type-approval certificate: ...
  - 3.2.17.5.5. Injector(s) ...
    - 3.2.17.5.5.1. Make(s): ...
    - 3.2.17.5.5.2. Type(s): ...
    - 3.2.17.5.5.3. Number of the type-approval certificate: ...
- 3.2.17.6. Direct injection
  - 3.2.17.6.1. Injection pump/pressure regulator <sup>(4)</sup>
    - 3.2.17.6.1.1. Make(s): ...
    - 3.2.17.6.1.2. Type(s): ...
    - 3.2.17.6.1.3. Injection timing: ...
    - 3.2.17.6.1.4. Number of the type-approval certificate: ...
  - 3.2.17.6.2. Injector(s) ...
    - 3.2.17.6.2.1. Make(s): ...
    - 3.2.17.6.2.2. Type(s): ...
    - 3.2.17.6.2.3. Opening pressure or characteristic diagram <sup>(41)</sup>: ...



- 3.2.17.6.2.4. Number of the type-approval certificate: ...
- 3.2.17.7. Electronic control unit (ECU)
- 3.2.17.7.1. Make(s): ...
- 3.2.17.7.2. Type(s): ...
- 3.2.17.7.3. Adjustment possibilities: ...
- 3.2.17.7.4. Software calibration number(s): ...
- 3.2.17.8. NG fuel-specific equipment
- 3.2.17.8.1. Variant 1 (only in the case of approvals of engines for several specific fuel compositions)
- 3.2.17.8.1.0.1. (Euro VI only) Self-adaptive feature? yes/no <sup>(4)</sup>
- 3.2.17.8.1.0.2. (Euro VI only) Calibration for a specific gas composition NG-H/NG-L/NG-HL/LNG <sup>(4)</sup>  
Transformation for a specific gas composition NG-Ht/NG-Lt/NG-HLt <sup>(4)</sup>
- 3.2.17.8.1.1. Fuel composition:
- |   |                     |                  |                  |
|---|---------------------|------------------|------------------|
| methane (CH <sub>4</sub> ):               | basis: ..... % mole | min. .... % mole | max. .... % mole |
| ethane (C <sub>2</sub> H <sub>6</sub> ):  | basis: ..... % mole | min. .... % mole | max. .... % mole |
| propane (C <sub>3</sub> H <sub>8</sub> ): | basis: ..... % mole | min. .... % mole | max. .... % mole |
| butane (C <sub>4</sub> H <sub>10</sub> ): | basis: ..... % mole | min. .... % mole | max. .... % mole |
| C <sub>5</sub> /C <sub>5</sub> +          | basis: ..... % mole | min. .... % mole | max. .... % mole |
| oxygen (O <sub>2</sub> ):                 | basis: ..... % mole | min. .... % mole | max. .... % mole |
| inert (N <sub>2</sub> , He, etc.):        | basis: ..... % mole | min. .... % mole | max. .... % mole |
- 3.2.17.8.1.2. Injector(s)
- 3.2.17.8.1.2.1. Make(s): ...
- 3.2.17.8.1.2.2. Type(s): ...
- 3.2.17.8.1.3. Others (if applicable): ...
- 3.2.17.8.2. Variant 2 (only in the case of approvals for several specific fuel compositions)
- 3.2.17.9. When appropriate, manufacturer reference of the documentation for installing the dual-fuel engine in a vehicle <sup>(42)</sup>
- 3.2.18. Hydrogen fuelling system: yes/no <sup>(4)</sup>
- 3.2.18.1. The number of the EU type-approval certificate issued in accordance with Regulation (EC) No 79/2009 of the European Parliament and of the Council <sup>(55)</sup>: ...

- 3.2.18.2. Electronic engine management control unit for hydrogen fuelling
  - 3.2.18.2.1. Make(s): ...
  - 3.2.18.2.2. Type(s): ...
  - 3.2.18.2.3. Emission-related adjustment possibilities: ...
- 3.2.18.3. Further documentation
  - 3.2.18.3.1. Description of the safeguarding of the catalyst at switch-over from petrol to hydrogen or back: ...
  - 3.2.18.3.2. System lay-out (electrical connections, vacuum connections compensation hoses, etc.): ...
  - 3.2.18.3.3. Drawing of the symbol: ...
- 3.2.19. H<sub>2</sub>NG fuelling system: yes/no <sup>(4)</sup>
  - 3.2.19.1. Percentage of hydrogen in the fuel (the maximum specified by the manufacturer): ...
  - 3.2.19.2. Number of the EU type-approval certificate issued in accordance with UN Regulation No 110: ...
  - 3.2.19.3. Electronic engine management control unit for H<sub>2</sub>NG fuelling
    - 3.2.19.3.1. Make(s): ...
    - 3.2.19.3.2. Type(s): ...
    - 3.2.19.3.3. Emission-related adjustment possibilities: ...
  - 3.2.19.4. Further documentation
    - 3.2.19.4.2. System lay-out (electrical connections, vacuum connections compensation hoses, etc.): ...
    - 3.2.19.4.3. Drawing of the symbol: ...
- 3.2.20. Heat storage information <sup>(1)</sup>
  - 3.2.20.1. Active heat storage device: yes/no <sup>(4)</sup>
    - 3.2.20.1.1. Enthalpy: ... (J)
  - 3.2.20.2. Insulation materials: yes/no <sup>(4)</sup>
    - 3.2.20.2.1. Insulation material: ...
    - 3.2.20.2.2. Insulation volume: ...
    - 3.2.20.2.3. Insulation weight: ...
    - 3.2.20.2.4. Insulation location: ...
    - 3.2.20.2.5. Worstcase approach vehicle cool down: yes/no <sup>(4)</sup>

- 3.2.20.2.5.1. (Not worst-case approach) Minimum soaking time,  $t_{\text{soak\_ATCT}}$  (hours): ...
- 3.2.20.2.5.2. (Not worst-case approach) Location of the engine temperature measurement: ...
- 3.2.20.2.6. Single interpolation family within the ATCT family approach: yes/no <sup>(4)</sup>
- 3.3. **Electric machine**  
(describe information of each type of electric machine separately)
- 3.3.1. Type (winding, excitation): ...
- 3.3.1.1.1. Maximum net power <sup>(43)</sup> ... kW (manufacturer's declared value)
- 3.3.1.1.2. Maximum 30 minutes power <sup>(43)</sup> ... kW (manufacturer's declared value)
- 3.3.1.2. Operating voltage: ... V
- 3.3.2. REESS
- 3.3.2.1. Number of cells: ...
- 3.3.2.2. Mass: ..... kg
- 3.3.2.3. Capacity: ..... Ah (Amp-hours)
- 3.3.2.4. Position: ...
- 3.4. **Combinations of propulsion energy converters**
- 3.4.1. Hybrid electric vehicle: yes/no <sup>(4)</sup>
- 3.4.2. Category of hybrid electric vehicle: off-vehicle charging/not off-vehicle charging <sup>(4)</sup>:
- 3.4.3. Operating mode switch: with/without <sup>(4)</sup>
- 3.4.3.1. Selectable modes
- 3.4.3.1.1. Pure electric: yes/no <sup>(4)</sup>
- 3.4.3.1.2. Pure fuel consuming: yes/no <sup>(4)</sup>
- 3.4.3.1.3. Hybrid modes: yes/no <sup>(4)</sup>  
(If yes, short description): ...
- 3.4.4. Description of the energy storage device: (REESS, capacitor, flywheel/generator)
- 3.4.4.1. Make(s): ...
- 3.4.4.2. Type(s): ...
- 3.4.4.3. Identification number: ...
- 3.4.4.4. Kind of electrochemical couple: ...
- 3.4.4.5. Energy: ... (for REESS: voltage and capacity Ah in 2 h, for capacitor: J, ...)

- 3.4.4.6. Charger: on board/external/without<sup>(4)</sup>
- 3.4.5. Electric machine (describe each type of electric machine separately)
  - 3.4.5.1. Make: ...
  - 3.4.5.2. Type: ...
  - 3.4.5.3. Primary use: traction motor/generator<sup>(4)</sup>
    - 3.4.5.3.1. When used as traction motor: single-/multimotors (number)<sup>(4)</sup>: ...
  - 3.4.5.4. Maximum power: ..... kW
  - 3.4.5.5. Working principle
    - 3.4.5.5.1. Direct current/alternating current/number of phases: ...
    - 3.4.5.5.2. Separate excitation/series/compound<sup>(4)</sup>
    - 3.4.5.5.3. Synchronous/asynchronous<sup>(4)</sup>
- 3.4.6. Control unit
  - 3.4.6.1. Make(s): ...
  - 3.4.6.2. Type(s): ...
  - 3.4.6.3. Identification number: ...
- 3.4.7. Power controller
  - 3.4.7.1. Make: ...
  - 3.4.7.2. Type: ...
  - 3.4.7.3. Identification number: ...
- 3.5. **Manufacturer's declared values for determination of CO<sub>2</sub> emissions/fuel consumption/electric consumption/electric range and details of eco-innovations (where applicable)<sup>(6b)</sup>**
  - 3.5.1. CO<sub>2</sub> mass emissions
    - 3.5.1.1. CO<sub>2</sub> mass emissions (urban conditions): ... g/km
    - 3.5.1.2. CO<sub>2</sub> mass emissions (extra-urban conditions): ... g/km
    - 3.5.1.3. CO<sub>2</sub> mass emissions (combined): ... g/km
  - 3.5.2. Fuel consumption (provide details for each reference fuel tested)
    - 3.5.2.1. Fuel consumption (urban conditions) ... l/100km or m<sup>3</sup>/100km or kg/100km<sup>(4)</sup>
    - 3.5.2.2. Fuel consumption (extra-urban conditions) ... l/100km or m<sup>3</sup>/100km or kg/100km<sup>(4)</sup>

- 3.5.2.3. Fuel consumption (combined) ...l/100km or m<sup>3</sup>/100km or kg/100km <sup>(4)</sup>
- 3.5.3. Electric energy consumption for electric vehicles
  - 3.5.3.1. Electric energy consumption for pure electric vehicles ... Wh/km
  - 3.5.3.2. Electric energy consumption for externally chargeable hybrid electric vehicles
    - 3.5.3.2.1. Electric energy consumption (Condition A, combined) ... Wh/km
    - 3.5.3.2.2. Electric energy consumption (Condition B, combined) ... Wh/km
    - 3.5.3.2.3. Electric energy consumption (weighted combined) ... Wh/km
  - 3.5.4. CO<sub>2</sub> emissions for heavy duty engines (Euro VI only)
    - 3.5.4.1. CO<sub>2</sub> mass emissions WHSC test <sup>(57)</sup>: ... g/kWh
    - 3.5.4.2. CO<sub>2</sub> mass emissions WHSC test in diesel mode <sup>(58)</sup>: ... g/kWh
    - 3.5.4.3. CO<sub>2</sub> mass emissions WHSC test in dual-fuel mode <sup>(42)</sup> ... g/kWh
    - 3.5.4.4. CO<sub>2</sub> mass emissions WHTC test <sup>(57)</sup> <sup>(59)</sup>: ... g/kWh
    - 3.5.4.5. CO<sub>2</sub> mass emissions WHTC test in diesel mode <sup>(58)</sup> <sup>(59)</sup>: ... g/kWh
    - 3.5.4.6. CO<sub>2</sub> mass emissions WHTC test in dual-fuel mode <sup>(42)</sup> <sup>(59)</sup>: ... g/kWh
  - 3.5.5. Fuel consumption for heavy duty engines (Euro VI only)
    - 3.5.5.1. Fuel consumption WHSC test <sup>(57)</sup>: ... g/kWh
    - 3.5.5.2. Fuel consumption WHSC test in diesel mode <sup>(58)</sup>: ... g/kWh
    - 3.5.5.3. Fuel consumption WHSC test in in dual-fuel mode <sup>(42)</sup>: ... g/kWh
    - 3.5.5.4. Fuel consumption WHTC test <sup>(57)</sup> <sup>(59)</sup>: ... g/kWh
    - 3.5.5.5. Fuel consumption WHTC test in diesel mode <sup>(58)</sup> <sup>(59)</sup>: ... g/kWh
    - 3.5.5.6. Fuel consumption WHTC test in dual-fuel mode <sup>(42)</sup> <sup>(59)</sup>: ... g/kWh
  - 3.5.6. Vehicle fitted with an eco-innovation within the meaning of Article 12 of Regulation (EC) No 443/2009 of the European Parliament and of the Council <sup>(60)</sup> for M<sub>1</sub> vehicles or Article 12 of Regulation (EU) No 510/2011 of the European Parliament and of the Council <sup>(61)</sup> for N<sub>1</sub> vehicles: yes/no <sup>(4)</sup>
    - 3.5.6.1. Type/Variant/Version of the baseline vehicle as referred to in Article 5 of Commission Implementing Regulation (EU) No 725/2011 <sup>(62)</sup> for M<sub>1</sub> vehicles or Article 5 of Commission Implementing Regulation (EU) No 427/2014 <sup>(63)</sup> for N<sub>1</sub> vehicles (if applicable) ...
    - 3.5.6.2. Existence of interactions between different eco-innovations: yes/no <sup>(4)</sup>

3.5.6.3. Emissions data related to the use of eco-innovations (repeat the table for each reference fuel tested)<sup>(64)</sup>

Decision approving the eco-innovation <sup>(65)</sup>	Code of the eco-innovation <sup>(66)</sup>	1. CO <sub>2</sub> emissions of the baseline vehicle (g/km)	2. CO <sub>2</sub> emissions of the eco-innovation vehicle (g/km)	3. CO <sub>2</sub> emissions of the baseline vehicle under Type 1 test-cycle <sup>(67)</sup>	4. CO <sub>2</sub> emissions of the eco-innovation vehicle under Type 1 test-cycle (= 3.5.1.3)	5. Usage factor (UF), i.e. temporal share of technology usage in normal operation conditions	CO <sub>2</sub> emissions savings ((1-2-(3-4))×5)
xxx-x/201x							
Total CO <sub>2</sub> emissions savings (g/km) <sup>(68)</sup>							

## 3.5.7. Manufacturer's declared values

3.5.7.1. Test vehicle parameters<sup>(1)</sup>

Vehicle	Vehicle Low (VL) if existing	Vehicle High (VH)	VM if existing	V representative (only for road load matrix family) <sup>(69)</sup>	Default values
Vehicle (variant/version)			—		
Road load method used (measurement or calculation by road load family)			—	—	
Road load information:					
Tyres make and type, if measurement method is used			—		
Tyre dimensions (front/rear), if measurement method is used			—		
Tyre rolling resistance (front/rear) (kg/t)					
Tyre pressure (front/rear) (kPa), if measurement method is used					
Delta C <sub>D</sub> × A of vehicle L compared to vehicle H (IP_H minus IP_L)	—		—	—	

Vehicle	Vehicle Low (VL) if existing	Vehicle High (VH)	VM if existing	V representative (only for road load matrix family) <sup>(69)</sup>	Default values
Delta $C_D \times A$ compared to road load family vehicle L (IP_H/L minus RL_L), if calculation by road load family			—	—	
Vehicle test mass (kg)					
Road load coefficients					
$f_0$ (N)					
$f_1$ (N/(km/h))					
$f_2$ (N/(km/h) <sup>2</sup> )					
Frontal area m <sup>2</sup> (0,000 m <sup>2</sup> )	—	—	—		
Cycle Energy Demand (J)					

- 3.5.7.1.1. Fuel used for the Type 1 test and selected for the measurement of the net power in accordance with Annex XX to Commission Regulation (EU) No 136/2014 <sup>(70)</sup>: ...
- 3.5.7.2. Combined CO<sub>2</sub> mass emissions
- 3.5.7.2.1. CO<sub>2</sub> mass emission for pure ICE vehicles and NOVC-HEVs
- 3.5.7.2.1.0. Minimum and maximum CO<sub>2</sub> values within the interpolation family
- 3.5.7.2.1.1. Vehicle high: ... g/km
- 3.5.7.2.1.1.0. Vehicle high (NEDC): ... g/km    3.5.7.2.1.2. Vehicle low (if applicable): ... g/km
- 3.5.7.2.1.2.0. Vehicle low (if applicable) (NEDC): ... g/km
- 3.5.7.2.1.3. Vehicle M (if applicable): ... g/km
- 3.5.7.2.1.3.0. Vehicle M (if applicable) (NEDC): ... g/km
- 3.5.7.2.2. Charge-Sustaining CO<sub>2</sub> mass emission for OVC-HEVs
- 3.5.7.2.2.1. Charge Sustaining CO<sub>2</sub> mass emission vehicle high: g/km
- 3.5.7.2.2.1.0. Combined CO<sub>2</sub> mass emission vehicle high (NEDC Condition B): g/km
- 3.5.7.2.2.2. Charge Sustaining CO<sub>2</sub> mass emission vehicle low (if applicable): g/km
- 3.5.7.2.2.2.0. Combined CO<sub>2</sub> mass emission vehicle low (if applicable) (NEDC Condition B): g/km
- 3.5.7.2.2.3. Charge Sustaining CO<sub>2</sub> mass emission vehicle M (if applicable): g/km

- 3.5.7.2.2.3.0. Combined CO<sub>2</sub> mass emission vehicle M (if applicable) (NEDC Condition B): g/km
- 3.5.7.2.3. Charge Depleting CO<sub>2</sub> mass emission and weighted CO<sub>2</sub> mass emission for OVC-HEVs
  - 3.5.7.2.3.1. Charge Depleting CO<sub>2</sub> mass emission of Vehicle high: ... g/km
    - 3.5.7.2.3.1.0. Charge Depleting CO<sub>2</sub> mass emission of Vehicle high (NEDC Condition A): ... g/km
    - 3.5.7.2.3.2. Charge Depleting CO<sub>2</sub> mass emission of Vehicle low (if applicable): ... g/km
      - 3.5.7.2.3.2.0. Charge Depleting CO<sub>2</sub> mass emission of Vehicle low (if applicable) (NEDC Condition A): ... g/km
      - 3.5.7.2.3.3. Charge Depleting CO<sub>2</sub> mass emission of Vehicle M (if applicable): ... g/km
        - 3.5.7.2.3.3.0. Charge Depleting CO<sub>2</sub> mass emission of Vehicle M (if applicable) (NEDC Condition A): ... g/km
        - 3.5.7.2.3.4. Minimum and maximum weighted CO<sub>2</sub> values within the OVC interpolation family: ... g/km
  - 3.5.7.3. Electric range for electrified vehicles
    - 3.5.7.3.1. Pure Electric Range (PER) for PEVs
      - 3.5.7.3.1.1. Vehicle high: ... km
      - 3.5.7.3.1.2. Vehicle low (if applicable): ... km
    - 3.5.7.3.2. All Electric Range AER for OVC-HEVs
      - 3.5.7.3.2.1. Vehicle high: ... km
      - 3.5.7.3.2.2. Vehicle low (if applicable): ... km
      - 3.5.7.3.2.3. Vehicle M (if applicable): ... km
  - 3.5.7.4. Charge Sustaining fuel consumption (FC<sub>CS</sub>) for FCHVs
    - 3.5.7.4.1. Vehicle high: ... kg/100km
    - 3.5.7.4.2. Vehicle low (if applicable): ... kg/100km
  - 3.5.7.5. Electric energy consumption for electrified vehicles
    - 3.5.7.5.1. Combined electric energy consumption (EC<sub>WLTC</sub>) for Pure electric vehicles
      - 3.5.7.5.1.1. Vehicle high: ... Wh/km
      - 3.5.7.5.1.2. Vehicle low (if applicable): ... Wh/km
    - 3.5.7.5.2. Utility factor weighted charge-depleting electric consumption EC<sub>AC,CD</sub> (combined)
      - 3.5.7.5.2.1. Vehicle high: ... Wh/km
      - 3.5.7.5.2.2. Vehicle low (if applicable): ... Wh/km
      - 3.5.7.5.2.3. Vehicle M (if applicable): ... Wh/km



3.5.8. Vehicle fitted with an eco-innovation within the meaning of Article 12 of Regulation (EC) No 443/2009 for M1 vehicles or Article 12 of Regulation (EU) No 510/2011 for N1 vehicles: yes/no (\*)

3.5.8.1. Type/Variant/Version of the baseline vehicle as referred to in Article 5 of Implementing Regulation (EU) No 725/2011 for M1 vehicles or Article 5 of Implementing Regulation (EU) No 427/2014 for N1 vehicles (if applicable): ...

3.5.8.2. Existence of interactions between different eco-innovations: yes/no (\*)

3.5.8.3. Emissions data related to the use of eco-innovations (repeat the table for each reference fuel tested) (64)

Decision approving the eco-innovation (65)	Code of the eco-innovation (66)	1. CO <sub>2</sub> emissions of the baseline vehicle (g/km)	2. CO <sub>2</sub> emissions of the eco-innovation vehicle (g/km)	3. CO <sub>2</sub> emissions of the baseline vehicle under type 1 test-cycle (67)	4. CO <sub>2</sub> emissions of the eco-innovation vehicle under type 1 test-cycle	5. Usage factor (UF), i.e. temporal share of technology usage in normal operation conditions	CO <sub>2</sub> emissions savings ((1 - 2) - (3 - 4)) × 5
xxx-x/201x							
Total NEDC CO <sub>2</sub> emissions saving (g/km) (68)							
Total WLTP CO <sub>2</sub> emissions saving (g/km) (68)							

3.5.9. CO<sub>2</sub> emissions and fuel consumption certification (for heavy-duty vehicles, as specified in Article 6 of Commission Regulation (EU) 2017/2400 (71))

3.5.9.1. Simulation tool license number: ...

3.5.9.2. Zero emission heavy-duty vehicle: yes/no (\*) (72) (169)

3.5.9.3. Vocational vehicle: yes/no (\*) (72) (170)

3.5.10. Declared maximum RDE values (if applicable)  
Complete RDE trip: NOx: ..., Particles (number): ...  
Urban RDE trip: NOx: ..., Particles (number): ...

3.6. **Temperatures permitted by the manufacturer**

3.6.1. Cooling system

3.6.1.1. Liquid cooling  
Maximum temperature at outlet: ..... K

3.6.1.2. Air cooling

3.6.1.2.1. Reference point: ...

- 3.6.1.2.2. Maximum temperature at reference point: ..... K
- 3.6.2. Maximum outlet temperature of the inlet intercooler: ..... K
- 3.6.3. Maximum exhaust temperature at the point in the exhaust pipe(s) adjacent to the outer flange(s) of the exhaust manifold or turbocharger: ..... K
- 3.6.4. Fuel temperature  
Minimum: ..... K – maximum: ..... K  
For diesel engines at injection pump inlet, for gas fuelled engines at pressure regulator final stage
- 3.6.5. Lubricant temperature  
Minimum: .... K – maximum: ..... K
- 3.6.6. Fuel pressure  
Minimum: ..... kPa – maximum: ..... kPa  
At pressure regulator final stage, NG fuelled gas engines only.

3.7. **Engine-driven equipment**

Power absorbed by the auxiliaries needed for operating the engine as specified in and under the operation conditions of UN Regulation No 85, Annex 5, paragraph 2.3.1 <sup>(73)</sup>

Equipment	Power absorbed (kW) at various engine speeds						
	Idle	Low speed	High speed	Speed A <sup>(74)</sup>	Speed B <sup>(74)</sup>	Speed C <sup>(74)</sup>	Ref. speed <sup>(75)</sup>
P(a)							
Auxiliaries needed for operating the engine (to be subtracted from measured engine power)							

3.8. **Lubrication system**

- 3.8.1. Description of the system
- 3.8.1.1. Position of lubricant reservoir: ...
- 3.8.1.2. Feed system (by pump/injection into intake/mixing with fuel, etc.) <sup>(4)</sup>
- 3.8.2. Lubricating pump
- 3.8.2.1. Make(s): ...
- 3.8.2.2. Type(s): ...
- 3.8.3. Mixture with fuel
- 3.8.3.1. Percentage: ...

- 3.8.4. Oil cooler: yes/no <sup>(4)</sup>
- 3.8.4.1. Drawing(s): ..... or
- 3.8.4.1.1. Make(s): ...
- 3.8.4.1.2. Type(s): ...
- 3.8.5. Lubricant specification: ... W ...
- 3.9. **Hydrogen propulsion**
- 3.9.1. Hydrogen system designed to use liquid hydrogen/Hydrogen system designed to use compressed (gaseous) hydrogen <sup>(4)</sup>
- 3.9.1.1. Description and drawing of the hydrogen system: ...
- 3.9.1.2. Name and address of the manufacturer(s) of the hydrogen system used for the propulsion of the vehicle: ...
- 3.9.1.3. Manufacturer's system code(s) (as marked on the system, or other means of identification): ...
- 3.9.1.4. Automatic shut-off valve(s): yes/no <sup>(4)</sup>
- 3.9.1.4.1. Make(s): ...
- 3.9.1.4.2. Type(s): ...
- 3.9.1.4.3. Maximum Allowable Working Pressure (MAWP) <sup>(4)</sup> <sup>(41)</sup>: ... MPa
- 3.9.1.4.4. Nominal working pressure(s) and if downstream of the first pressure regulator, maximum allowable working pressure(s) <sup>(4)</sup> <sup>(41)</sup>: ... MPa
- 3.9.1.4.5. Operating temperature <sup>(4)</sup>: ...
- 3.9.1.4.6. Number of filling cycles or duty cycles as appropriate <sup>(4)</sup>: ...
- 3.9.1.4.7. Type-approval certificate number: ...
- 3.9.1.4.8. Material: ...
- 3.9.1.4.9. Operating principles: ...
- 3.9.1.4.10. Description and drawing: ...
- 3.9.1.5. Check valve(s) or non-return valve(s): yes/no <sup>(4)</sup>
- 3.9.1.5.1. Make(s): ...
- 3.9.1.5.2. Type(s): ...
- 3.9.1.5.3. Maximum Allowable Working Pressure (MAWP) <sup>(4)</sup> <sup>(41)</sup>: ... MPa
- 3.9.1.5.4. Nominal working pressure(s) and if downstream of the first pressure regulator, maximum allowable working pressure(s) <sup>(4)</sup> <sup>(41)</sup>: ... MPa
- 3.9.1.5.5. Operating temperature <sup>(4)</sup>: ...

- 3.9.1.5.6. Number of filling cycles or duty cycles as appropriate <sup>(4)</sup>: ...
- 3.9.1.5.7. Type-approval certificate number: ...
- 3.9.1.5.8. Material: ...
- 3.9.1.5.9. Operating principles: ...
- 3.9.1.5.10. Description and drawing: ...
- 3.9.1.6. Container(s) and container assembly: yes/no <sup>(4)</sup>
  - 3.9.1.6.1. Make(s): ...
  - 3.9.1.6.2. Type(s): ...
  - 3.9.1.6.3. Maximum Allowable Working Pressure (MAWP) <sup>(4)</sup> <sup>(41)</sup>: ... MPa
  - 3.9.1.6.4. Nominal working pressure <sup>(4)</sup> <sup>(41)</sup>: ... MPa
  - 3.9.1.6.5. Number of filling cycles <sup>(4)</sup>: ...
  - 3.9.1.6.6. Operating temperature <sup>(4)</sup>: ...
  - 3.9.1.6.7. Capacity: ... litres  
(water)
  - 3.9.1.6.8. Type-approval certificate number: ...
  - 3.9.1.6.9. Material: ...
  - 3.9.1.6.10. Operating principles: ...
  - 3.9.1.6.11. Description and drawing: ...
- 3.9.1.7. Fittings: yes/no <sup>(4)</sup>
  - 3.9.1.7.1. Make(s): ...
  - 3.9.1.7.2. Type(s): ...
  - 3.9.1.7.3. Nominal working pressure(s) and if downstream of the first pressure regulator, maximum allowable working pressure(s) <sup>(41)</sup>: ... MPa
  - 3.9.1.7.4. Number of filling cycles or duty cycles as appropriate: ...
  - 3.9.1.7.5. Type-approval certificate number: ...
  - 3.9.1.7.6. Material: ...
  - 3.9.1.7.7. Operating principles: ...
  - 3.9.1.7.8. Description and drawing: ...
- 3.9.1.8. Flexible fuelline(s): yes/no <sup>(4)</sup>
  - 3.9.1.8.1. Make(s): ...

- 3.9.1.8.2. Type(s): ...
- 3.9.1.8.3. Maximum Allowable Working Pressure (MAWP) <sup>(4)</sup> <sup>(41)</sup>: ... MPa
- 3.9.1.8.4. Nominal working pressure(s) and if downstream of the first pressure regulator, maximum allowable working pressure(s) <sup>(4)</sup> <sup>(41)</sup>: ... MPa
- 3.9.1.8.5. Operating temperature <sup>(4)</sup>: ...
- 3.9.1.8.6. Number of filling cycles or duty cycles as appropriate <sup>(4)</sup>: ...
- 3.9.1.8.7. Type-approval certificate number: ...
- 3.9.1.8.8. Material: ...
- 3.9.1.8.9. Operating principles: ...
- 3.9.1.8.10. Description and drawing: ...
- 3.9.1.9. Heat exchanger(s): yes/no <sup>(4)</sup>
- 3.9.1.9.1. Make(s): ...
- 3.9.1.9.2. Type(s): ...
- 3.9.1.9.3. Maximum Allowable Working Pressure (MAWP) <sup>(4)</sup> <sup>(41)</sup>: ... MPa
- 3.9.1.9.4. Nominal working pressure(s) and if downstream of the first pressure regulator, maximum allowable working pressure(s) <sup>(4)</sup> <sup>(41)</sup>: ... MPa
- 3.9.1.9.5. Operating temperature <sup>(4)</sup>: ...
- 3.9.1.9.6. Number of filling cycles or duty cycles as appropriate <sup>(4)</sup>: ...
- 3.9.1.9.7. Type-approval certificate number: ...
- 3.9.1.9.8. Material: ...
- 3.9.1.9.9. Operating principles: ...
- 3.9.1.9.10. Description and drawing: ...
- 3.9.1.10. Hydrogen filter(s): yes/no <sup>(4)</sup>
- 3.9.1.10.1. Make(s): ...
- 3.9.1.10.2. Type(s): ...
- 3.9.1.10.3. Nominal working pressure(s) and if downstream of the first pressure regulator, maximum allowable working pressure(s) <sup>(4)</sup> <sup>(41)</sup>: ... MPa
- 3.9.1.10.4. Number of filling cycles or duty cycles as appropriate <sup>(4)</sup>: ...
- 3.9.1.10.5. Type-approval certificate number: ...
- 3.9.1.10.6. Material: ...
- 3.9.1.10.7. Operating principles: ...

- 3.9.1.10.8. Description and drawing: ...
- 3.9.1.11. Hydrogen leakage detection sensors: ...
  - 3.9.1.11.1. Make(s): ...
  - 3.9.1.11.2. Type(s): ...
  - 3.9.1.11.3. Maximum Allowable Working Pressure (MAWP) <sup>(4)</sup> <sup>(41)</sup>: ... MPa
  - 3.9.1.11.4. Nominal working pressure(s) and if downstream of the first pressure regulator, maximum allowable working pressure(s) <sup>(4)</sup> <sup>(41)</sup>: ... MPa
  - 3.9.1.11.5. Operating temperature <sup>(4)</sup>: ...
  - 3.9.1.11.6. Number of filling cycles or duty cycles as appropriate <sup>(4)</sup>: ...
  - 3.9.1.11.7. Set values: ...
  - 3.9.1.11.8. Type-approval certificate number: ...
  - 3.9.1.11.9. Material: ...
  - 3.9.1.11.10. Operating principles: ...
  - 3.9.1.11.11. Description and drawing: ...
- 3.9.1.12. Manual or automatic valve(s): yes/no <sup>(4)</sup>
  - 3.9.1.12.1. Make(s): ...
  - 3.9.1.12.2. Type(s): ...
  - 3.9.1.12.3. Maximum Allowable Working Pressure (MAWP) <sup>(4)</sup> <sup>(41)</sup>: ... MPa
  - 3.9.1.12.4. Nominal working pressure(s) and if downstream of the first pressure regulator, maximum allowable working pressure(s) <sup>(4)</sup> <sup>(41)</sup>: ... MPa
  - 3.9.1.12.5. Operating temperature <sup>(4)</sup>: ...
  - 3.9.1.12.6. Number of filling cycles or duty cycles as appropriate <sup>(4)</sup>: ...
  - 3.9.1.12.7. Type-approval certificate number: ...
  - 3.9.1.12.8. Material: ...
  - 3.9.1.12.9. Operating principles: ...
  - 3.9.1.12.10. Description and drawing: ...
- 3.9.1.13. Pressure and/or temperature and/or hydrogen and/or flow sensor(s) <sup>(4)</sup>: yes/no <sup>(4)</sup>
  - 3.9.1.13.1. Make(s): ...
  - 3.9.1.13.2. Type(s): ...

- 3.9.1.13.3. Maximum Allowable Working Pressure (MAWP) <sup>(4)</sup> <sup>(41)</sup>: ... MPa
- 3.9.1.13.4. Nominal working pressure(s) and if downstream of the first pressure regulator, maximum allowable working pressure(s) <sup>(4)</sup> <sup>(41)</sup>: ... MPa
- 3.9.1.13.5. Operating temperature <sup>(4)</sup>: ...
- 3.9.1.13.6. Number of filling cycles or duty cycles as appropriate <sup>(4)</sup>: ...
- 3.9.1.13.7. Set values: ...
- 3.9.1.13.8. Type-approval certificate number: ...
- 3.9.1.13.9. Material: ...
- 3.9.1.13.10. Operating principles: ...
- 3.9.1.13.11. Description and drawing: ...
- 3.9.1.14. Pressure regulator(s): yes/no <sup>(4)</sup>
- 3.9.1.14.1. Make(s): ...
- 3.9.1.14.2. Type(s): ...
- 3.9.1.14.3. Number of main adjustment points: ...
- 3.9.1.14.4. Description of principle of adjustment through main adjustment points: ...
- 3.9.1.14.5. Number of idle adjustment points: ...
- 3.9.1.14.6. Description of principles of adjustment through idle adjustment points: ...
- 3.9.1.14.7. Other adjustment possibilities: if so and which (description and drawings): ...
- 3.9.1.14.8. Maximum Allowable Working Pressure (MAWP) <sup>(4)</sup> <sup>(41)</sup>: ... MPa
- 3.9.1.14.9. Nominal working pressure(s) and if downstream of the first pressure regulator, maximum allowable working pressure(s) <sup>(4)</sup> <sup>(41)</sup>: ... MPa
- 3.9.1.14.10. Operating temperature <sup>(4)</sup>: ...
- 3.9.1.14.11. Number of filling cycles or duty cycles as appropriate <sup>(4)</sup>: ...
- 3.9.1.14.12. Input and output pressure: ...
- 3.9.1.14.13. Type-approval certificate number: ...
- 3.9.1.14.14. Material: ...
- 3.9.1.14.15. Operating principles: ...
- 3.9.1.14.16. Description and drawing: ...
- 3.9.1.15. Pressure relief device: yes/no <sup>(4)</sup>

- 3.9.1.15.1. Make(s): ...
- 3.9.1.15.2. Type(s): ...
- 3.9.1.15.3. Maximum Allowable Working Pressure (MAWP) <sup>(4)</sup> <sup>(41)</sup>: ... MPa
- 3.9.1.15.4. Operating temperature <sup>(4)</sup>: ...
- 3.9.1.15.5. Set pressure <sup>(4)</sup>: ...
- 3.9.1.15.6. Set temperature <sup>(4)</sup>: ...
- 3.9.1.15.7. Blowoff capacity <sup>(4)</sup>: ...
- 3.9.1.15.8. Normal maximum operating temperature <sup>(4)</sup> <sup>(41)</sup>: ... °C
- 3.9.1.15.9. Nominal working pressure(s) <sup>(4)</sup> <sup>(41)</sup>: ... MPa
- 3.9.1.15.10. Number of filling cycles (Class 0 components only) <sup>(4)</sup>: ...
- 3.9.1.15.11. Type-approval certificate number: ...
- 3.9.1.15.12. Material: ...
- 3.9.1.15.13. Operating principles: ...
- 3.9.1.15.14. Description and drawing: ...
- 3.9.1.16. Pressure relief valve: yes/no <sup>(4)</sup>
- 3.9.1.16.1. Make(s): ...
- 3.9.1.16.2. Type(s): ...
- 3.9.1.16.3. Nominal working pressure(s) and if downstream of the first pressure regulator, maximum allowable working pressure(s) <sup>(4)</sup> <sup>(41)</sup>: ... MPa
- 3.9.1.16.4. Set pressure <sup>(4)</sup>: ...
- 3.9.1.16.5. Number of filling cycles or duty cycles as appropriate <sup>(4)</sup>: ...
- 3.9.1.16.6. Type-approval certificate number: ...
- 3.9.1.16.7. Material: ...
- 3.9.1.16.8. Operating principles: ...
- 3.9.1.16.9. Description and drawing: ...
- 3.9.1.17. Refuelling connection or receptacle: yes/no <sup>(4)</sup>
- 3.9.1.17.1. Make(s): ...
- 3.9.1.17.2. Type(s): ...



- 3.9.1.17.3. Maximum Allowable Working Pressure (MAWP) <sup>(4)</sup> <sup>(41)</sup>: ... MPa
- 3.9.1.17.4. Operating temperature <sup>(4)</sup>: ...
- 3.9.1.17.5. Nominal working pressure(s) <sup>(4)</sup> <sup>(41)</sup>: ... MPa
- 3.9.1.17.6. Number of filling cycles (Class 0 components only) <sup>(4)</sup>: ...
- 3.9.1.17.7. Type-approval certificate number: ...
- 3.9.1.17.8. Material: ...
- 3.9.1.17.9. Operating principles: ...
- 3.9.1.17.10. Description and drawing: ...
- 3.9.1.18. Removable storage system connector: yes/no <sup>(4)</sup>
- 3.9.1.18.1. Make(s): ...
- 3.9.1.18.2. Type(s): ...
- 3.9.1.18.3. Nominal working pressure(s) and maximum allowable working pressure(s) <sup>(41)</sup>: ... MPa
- 3.9.1.18.4. Number of duty cycles: ...
- 3.9.1.18.5. Type-approval certificate number: ...
- 3.9.1.18.6. Material: ...
- 3.9.1.18.7. Operating principles: ...
- 3.9.1.18.8. Description and drawing: ...
- 3.9.2. Further documentation
- 3.9.2.1. Process diagram (flow chart) of the hydrogen system
- 3.9.2.2. System layout including electrical connections and other external system (inputs and/or out-puts etc.)
- 3.9.2.3. Key to symbols used in documentation
- 3.9.2.4. Adjustment data of pressure relief devices and pressure regulators
- 3.9.2.5. Layout of cooling/heating system(s) including Nominal or Maximum Allowable Working Pressure (NAWP or MAWP) and operating temperatures
- 3.9.2.6. Drawings showing requirements for installation and operation.
- 4. TRANSMISSION <sup>(6)</sup>
- 4.1. Drawing of the transmission: ...
- 4.2. Type (mechanical, hydraulic, electric, etc.): ...

- 4.2.1. A brief description of the electrical/electronic components (if any): ...
- 4.3. Moment of inertia of engine flywheel: ...
- 4.3.1. Additional moment of inertia with no gear engaged: ...
- 4.4. **Clutch(es): ...**
- 4.4.1. Type: ...
- 4.4.2. Maximum torque conversion: ...
- 4.5. **Gearbox**
- 4.5.1. Type: Manual/Automatic/CVT(continuously variable transmission)/Fixedratio/Automised/Other/Wheel hub <sup>(†)</sup>
- 4.5.1.4. Torque rating (for heavy duty vehicles): ...
- 4.5.1.5. Number of clutches: ...
- 4.5.2. Location relative to the engine: ...
- 4.5.3. Method of control: ...
- 4.5.4. Additional gearbox for alternative propulsions: ...
- 4.6. **Gear ratios**

Gear	Internal gearbox ratios (ratio of engine to gearbox output shaft revolutions)	Final drive ratio(s) (ratio of gearbox output shaft to driven wheel revolutions)	Total gear ratios
Maximum for CVT			
1			
2			
3			
...			
Minimum for CVT			
Reverse			

- 4.6.1. Gearshift <sup>(†)</sup>
- 4.6.1.1. Gear 1 excluded: yes/no <sup>(†)</sup>
- 4.6.1.2.  $n_{95\_high}$  for each gear: ...  $\text{min}^{-1}$
- 4.6.1.3.  $n_{\text{min\_drive}}$

- 4.6.1.3.1. 1<sup>st</sup> gear: ... min<sup>-1</sup>
- 4.6.1.3.2. 1<sup>st</sup> gear to 2<sup>nd</sup>: ... min<sup>-1</sup>
- 4.6.1.3.3. 2<sup>nd</sup> gear to standstill: ... min<sup>-1</sup>
- 4.6.1.3.4. 2<sup>nd</sup> gear: ... min<sup>-1</sup>
- 4.6.1.3.5. 3<sup>rd</sup> gear and beyond: ... min<sup>-1</sup>
- 4.6.1.4.  $n_{\min\_drive\_set}$  for acceleration/constant speed phases ( $n_{\min\_drive\_up}$ ): ... min<sup>-1</sup>
- 4.6.1.5.  $n_{\min\_drive\_set}$  for deceleration phases ( $n_{\min\_drive\_down}$ ):
- 4.6.1.6. initial period of time
- 4.6.1.6.1.  $t_{start\_phase}$ : ... s
- 4.6.1.6.2.  $n_{\min\_drive\_start}$ : ... min<sup>-1</sup>
- 4.6.1.6.3.  $n_{\min\_drive\_up\_start}$ : ... min<sup>-1</sup>
- 4.6.1.7. use of ASM: yes/no <sup>(4)</sup>
- 4.6.1.7.1. ASM values: ...
- 4.7. Maximum vehicle design speed (in km/h) <sup>(77)</sup>: ...
- 4.8. **Speedometer and odometer**  
Speedometer:
  - 4.8.1. Method of operation and description of drive mechanism: ...
  - 4.8.2. Instrument constant: ...
  - 4.8.3. Tolerance of the measuring mechanism (pursuant to paragraph 2.2.3 of UN Regulation No 39 of the Economic Commission for Europe of the United Nations (UN/ECE) <sup>(78)</sup>): ...
  - 4.8.4. Overall transmission ratio (pursuant to paragraph 2.2.2 of UN Regulation No 39) or equivalent data: ...
  - 4.8.5. Diagram of the speedometer scale or other forms of display: ...  
Odometer:
    - 4.8.6. The technical constant of odometer (pursuant to paragraph 2.2.4 of UN Regulation No 39: ...
    - 4.8.7. The number of numerals: ...
- 4.9. **Tachograph: yes/no** <sup>(4)</sup>
  - 4.9.1. Approval mark: ...
- 4.10. Differential lock: yes/no/optional <sup>(4)</sup>

- 4.11. **Gearshift indicator (GSI)**
- 4.11.1. Acoustic indication available yes/no <sup>(4)</sup>. If yes, description of sound and sound level at the driver's ear in dB(A). (Acoustic indication always switchable on/off)
- 4.11.2. Information according to point 4.6 of Annex I to Commission Regulation (EU) No 65/2012 <sup>(79)</sup> (manufacturer's declared value)
- 4.11.3. Photographs and/or drawings of the gear shift indicator instrument and brief description of the system components and operation:
- 4.12. Gearbox lubricant: ... W ...
- 5. AXLES
- 5.1. Description of each axle: ...
- 5.2. Make: ...
- 5.3. Type: ...
- 5.4. Position of retractable axle(s): ...
- 5.5. Position of loadable axle(s): ...
- 6. SUSPENSION
- 6.1. Drawing of the suspension arrangements: ...
- 6.2. Type and design of the suspension of each axle or group of axles or wheel: ...
- 6.2.1. Level adjustment: yes/no/optional <sup>(4)</sup>
- 6.2.2. A brief description of the electrical/electronic components (if any): ...
- 6.2.3. Air-suspension for driving axle(s): yes/no <sup>(4)</sup>
- 6.2.3.1. Suspension of driving axle(s) equivalent to air-suspension: yes/no <sup>(4)</sup>
- 6.2.3.2. Frequency and damping of the oscillation of the sprung mass: ...
- 6.2.4. Air-suspension for non-driving axle(s): yes/no <sup>(4)</sup>
- 6.2.4.1. Suspension of non-driving axle(s) equivalent to air-suspension: yes/no <sup>(4)</sup>
- 6.2.4.2. Frequency and damping of the oscillation of the sprung mass: ...
- 6.3. Characteristics of the springing parts of the suspension (design, characteristics of the materials and dimensions): ...
- 6.4. Stabilisers: yes/no/optional <sup>(4)</sup>
- 6.5. Shock absorbers: yes/no/optional <sup>(4)</sup>
- 6.6. **Tyres and wheels**
- 6.6.1. Tyre/wheel combination(s)

6.6.1.1. Axles

6.6.1.1.1. Axle 1: ...

6.6.1.1.1.1. Tyre size designation	6.6.1.1.1.2. Load-capacity index	6.6.1.1.1.3. Speed category symbol <sup>(80)</sup>	6.6.1.1.1.4. Wheel rim size (s)	6.6.1.1.1.5. Wheel off-set(s)	6.6.1.1.1.6. Rolling resistance coefficient (RRC)

6.6.1.1.2. Axle 2: ...

6.6.1.1.2.1. Tyre size designation	6.6.1.1.2.2. Load-capacity index	6.6.1.1.2.3. Speed category symbol <sup>(80)</sup>	6.6.1.1.2.4. Wheel rim size (s)	6.6.1.1.2.5. Wheel off-set(s)	6.6.1.1.2.6. Rolling resistance coefficient (RRC)

etc.

6.6.1.2. Spare wheel, if any: ...

6.6.2. Upper and lower limits of rolling radii

6.6.2.1. Axle 1: ... mm

6.6.2.2. Axle 2: ... mm

6.6.2.3. Axle 3: ... mm

6.6.2.4. Axle 4: ... mm

etc.

6.6.3. Tyre pressure(s) as recommended by the vehicle manufacturer: ... kPa

6.6.4. Snow traction device/tyre/wheel combination on the front and/or rear axle that is suitable for the type of vehicle, as recommended by the manufacturer: ...

6.6.5. Brief description of temporary use spare unit (if any): ...

7. STEERING

7.1. Schematic diagram of steered axle(s) showing steering geometry: ...

7.2. **Transmission and control**

7.2.1. Type of steering transmission (specify for front and rear, if applicable): ...

7.2.2. Linkage to wheels (including other than mechanical means; specify for front and rear, if applicable): ...

7.2.2.1. A brief description of the electrical/electronic components (if any): ...

7.2.3. Method of assistance (if any): ...

- 7.2.3.1. Method and diagram of operation, make(s) and type(s): ...
- 7.2.4. Diagram of the steering equipment as a whole, showing the position on the vehicle of the various devices influencing its steering behaviour: ...
- 7.2.5. Schematic diagram(s) of the steering control(s): ...
- 7.2.6. Range and method of adjustment (if any), of the steering control: ...
- 7.3. **Maximum steering angle of the wheels**
- 7.3.1. To the right: ... degrees; number of turns of the steering wheel (or equivalent data): ...
- 7.3.2. To the left: ... degrees; number of turns of the steering wheel (or equivalent data): ...
8. BRAKES  
(The following particulars, including means of identification, where applicable, are to be given)
- 8.1. Type and characteristics of the brakes including details and drawings of i.a. the drums, discs, hoses, make and type of shoe/pad assemblies and/or linings, effective braking areas, radius of drums, shoes or discs, mass of drums, adjustment devices, electro-magnetic action, fluid braking forces, engine braking, relevant parts of the axle(s) and suspension: ...
- 8.2. Operating diagram, description and/or drawing of the braking system including details and drawings of the transmission and controls:
- 8.2.1. Service braking system: ...
- 8.2.2. Secondary braking system: ...
- 8.2.3. Parking braking system: ...
- 8.2.4. Any additional braking system: ...
- 8.2.5. Break-away braking system: ...
- 8.2.6. Category of regenerative braking system: A/B <sup>(4)</sup>
- 8.2.6.1. Description of the regeneration system: ...
- 8.2.6.1.1. Make control unit: ...
- 8.2.6.1.2. Type control unit: ...
- 8.2.6.1.3. Axle the braking system is fitted to: Axle 1/Axle 2/Axle 3/ ...
- 8.2.6.1.4. Parameters controlling the brake force: ...
- 8.3. Control and transmission of trailer braking systems in vehicles designed to tow a trailer: ...
- 8.4. Vehicle is equipped to tow a trailer with electric/pneumatic/hydraulic <sup>(4)</sup> service brakes: yes/no <sup>(4)</sup>
- 8.5. Anti-lock braking system: yes/no/optional <sup>(4)</sup>

- 8.5.1. Make of the ABS unit: ...
- 8.5.2. Type of the ABS unit: ...
- 8.5.3. For vehicles with anti-lock systems, description of system operation (including any electronic parts), electric block diagram, hydraulic or pneumatic circuit plan: ...
- 8.6. Calculation and curves according to Annex 10 to UN Regulation No 13 or to the Annex 14 thereto, if applicable: ...
- 8.7. Description and/or drawing of the energy supply, also to be specified for power-assisted braking systems: ...
- 8.7.1. In the case of compressed-air braking systems, working pressure  $p_2$  in the pressure reservoir(s): ...
- 8.7.2. In the case of vacuum braking systems, the initial energy level in the reservoir(s): ...
- 8.8. Calculation of the braking system: Determination of the ratio between the total braking forces at the circumference of the wheels and the force applied to the braking control: ...
- 8.9. Brief description of the braking system according to paragraph 12 of Annex 2 to UN Regulation No 13: ...
- 8.10. If claiming exemptions from the Type I and/or Type II or Type III tests, state the number of the report in accordance with Appendix 3 of Annex 11 to UN Regulation No 13: ...
- 8.11. Particulars of the type(s) of endurance braking system(s): ...
- 9. BODYWORK
- 9.1. Type of bodywork using the codes defined in Part C of Annex I to Regulation (EU) 2018/858 or in case of a special purpose vehicle the codes defined in point 5 to Part A of that Annex: ...
- 9.2. Materials used and methods of construction: ...
- 9.3. **Occupant doors, latches and hinges**
- 9.3.1. Door configuration and number of doors: ...
- 9.3.1.1. Dimensions, direction and maximum angle of opening: ...
- 9.3.2. Drawing of latches and hinges and of their position in the doors: ...
- 9.3.3. Technical description of latches and hinges: ...
- 9.3.4. Details, including dimensions, of entrances, steps and necessary handles where applicable: ...
- 9.3.5. Electrical/electronic components of the door system: ...
- 9.3.5.1. Brief description of any electrical/electronic components: ...
- 9.3.5.2. Description of electrical/electronic functionality in the door system: ...
- 9.3.5.2.1. Rolling door locks fitted: yes/no/optional (\*)

- 9.4. **Field of vision**
- 9.4.1. Particulars of the primary reference marks in sufficient detail to enable them to be readily identified and the position of each in relation to the others and to the R-point to be verified: ...
- 9.4.2. Drawing(s) or photograph(s) showing the location of component parts within the 180° forward field of vision: ...
- 9.5. **Windscreen and other windows**
- 9.5.1. Windscreen
- 9.5.1.1. Materials used: ...
- 9.5.1.2. Method of mounting: ...
- 9.5.1.3. Angle of inclination: ...
- 9.5.1.4. Number(s) of the type-approval certificate(s): ...
- 9.5.1.5. Windscreen accessories and the position in which they are fitted together with a brief description of any electrical/electronic components involved: ...
- 9.5.2. Other windows
- 9.5.2.1. Materials used: ...
- 9.5.2.2. Number(s) of the type-approval certificate(s): ...
- 9.5.2.3. A brief description of the electrical/electronic components (if any) of the window lifting mechanism: ...
- 9.5.2.3.1. Description of the auto-reversing system: ...
- 9.5.3. Opening roof glazing
- 9.5.3.1. Materials used: ...
- 9.5.3.2. Number(s) of the type-approval certificate (s): ...
- 9.5.3.3. A brief description of the electrical/electronic components (if any) of the opening roof mechanism: ...
- 9.5.3.3.1. Description of the auto-reversing system: ...
- 9.5.4. Other glasspanes
- 9.5.4.1. Materials used: ...
- 9.5.4.2. Number(s) of the type-approval certificate (s): ...
- 9.6. **Windscreen wiper(s)**
- 9.6.1. Detailed technical description (including photographs or drawings): ...
- 9.6.1.1. Dimensions of the wiper arm and wiper blade: ...



- 9.7. **Windscreen and headlamp washer**
- 9.7.1. Detailed technical description (including photographs or drawings) or, if approved as separate technical unit, number of the type-approval certificate: ...
- 9.8. **Defrosting and demisting**
- 9.8.1. Detailed technical description (including photographs or drawings): ...
- 9.8.2. Maximum electrical consumption: ... kW
- 9.9. **Devices for indirect vision**
- 9.9.1. Rear-view mirrors, stating for each mirror:
- 9.9.1.1. Make: ...
- 9.9.1.2. Type-approval mark: ...
- 9.9.1.3. Variant: ...
- 9.9.1.4. Drawing(s) for the identification of the mirror showing the position of the mirror relative to the vehicle structure: ...
- 9.9.1.5. Details of the method of attachment including that part of the vehicle structure to which it is attached: ...
- 9.9.1.6. Optional equipment which may affect the rearward field of vision: ...
- 9.9.1.7. A brief description of the electronic components (if any): ...
- 9.9.2. Devices for indirect vision other than mirrors: ...
- 9.9.2.1. Type and description of the device: ...
- 9.9.2.1.1. In the case of a camera-monitor device, the detection distance (mm), contrast, luminance range, glare correction, display performance (black and white/colour), image repetition frequency, luminance reach of the monitor: ...
- 9.9.2.1.2. Sufficiently detailed drawings to identify the complete device, including installation instructions; the position for the EU type-approval mark has to be indicated on the drawings.
- 9.10. **Interior arrangement**
- 9.10.1. Interior protection for occupants
- 9.10.1.1. Layout drawing or photographs showing the position of the attached sections or views: ...
- 9.10.1.2. Photograph or drawing showing the reference zone including the exempted area referred to in paragraph 2.3.1 to UN Regulation No 21 of the Economic Commission for Europe of the United Nations (UN/ECE)<sup>(81)</sup>: ...
- 9.10.1.3. Photographs, drawings and/or an exploded view of the interior fittings, showing the parts in the passenger compartment and the materials used (with the exception of interior rear view mirrors), arrangement of controls, roof and opening roof, backrest, seats and the rear part of seats: ...

- 9.10.2. Arrangement and identification of controls, tell-tales and indicators
- 9.10.2.1. Photographs and/or drawings of the arrangement of symbols and controls, tell-tales and indicators: ...
- 9.10.2.2. Photographs and/or drawings of the identification of controls, tell-tales and indicators and of the vehicle parts referred to UN Regulation No 121 <sup>(82)</sup> of the Economic Commission for Europe of the United Nations (UN/ECE) where relevant: ...
- 9.10.3. Seats
- 9.10.3.1. Number of seating positions <sup>(83)</sup>: ...
- 9.10.3.1.1. Location and arrangement: ...
- 9.10.3.2. Seat(s) designated for use only when the vehicle is stationary: ...
- 9.10.3.3. Mass: ...
- 9.10.3.4. Characteristics: for seats not type-approved as components, description and drawings of
- 9.10.3.4.1. The seats and their anchorages: ...
- 9.10.3.4.2. The adjustment system: ...
- 9.10.3.4.3. The displacement and locking systems: ...
- 9.10.3.4.4. The seat-belt anchorages (if incorporated in the seat structure): ...
- 9.10.3.4.5. The parts of the vehicle used as anchorages: ...
- 9.10.3.5. Coordinates or drawing of the R-point <sup>(84)</sup>
- 9.10.3.5.1. Driver's seat: ...
- 9.10.3.5.2. All other seating positions: ...
- 9.10.3.6. Design torso angle
- 9.10.3.6.1. Driver's seat: ...
- 9.10.3.6.2. All other seating positions: ...
- 9.10.3.7. Range of seat adjustment
- 9.10.3.7.1. Driver's seat: ...
- 9.10.3.7.2. All other seating positions: ...
- 9.10.3.8. Detailed description of the electrical/electronic components (if any) of the seat adjustment system: ...
- 9.10.3.9. Description of the luggage compartment space if the seat back(s) constitute the forward boundary of this space: ...
- 9.10.3.10. Vehicle equipped with a partitioning system: yes/no/optional <sup>(4)</sup>

- 9.10.3.10.1. Detailed description of the partitioning system including the mounting to the vehicle structure: ...
- 9.10.4. Head restraints
  - 9.10.4.1. Type(s) of head restraints: integrated/detachable/separate (\*)
  - 9.10.4.2. Number(s) of the type-approval certificate (s), if available: ...
  - 9.10.4.3. For head restraints not yet approved
    - 9.10.4.3.1. A detailed description of the head restraint, specifying in particular the nature of the padding material or materials and, where applicable, the position and specifications of the braces and anchorage pieces for the type of seat for which approval is sought: ...
    - 9.10.4.3.2. In the case of a 'separate' head restraint
      - 9.10.4.3.2.1. A detailed description of the structural zone to which the head restraint is intended to be fixed: ...
      - 9.10.4.3.2.2. Dimensional drawings of the characteristic parts of the structure and the head restraint: ...
    - 9.10.4.4. Detailed description of the electrical/electronic components (if any) of the head restraint adjustment system: ...
  - 9.10.5. Heating systems for the passenger compartment
    - 9.10.5.1. A brief description of the vehicle type with regard to the heating system if the heating system uses the heat of the engine cooling fluid: ...
    - 9.10.5.2. A detailed description of the vehicle type with regard to the heating if the cooling air or the exhaust gases of the engine are used as heat source, including:
      - 9.10.5.2.1. Layout drawing of the heating system showing its position in the vehicle: ...
      - 9.10.5.2.2. Layout drawing of the heat exchanger for heating systems using the exhaust gases for heating, or of the parts where the heat exchange takes place (for heating systems using the engine cooling air for heating): ...
      - 9.10.5.2.3. Sectional drawing of the heat exchanger or the parts respectively where the heat exchange takes place indicating the thickness of the wall, used materials and characteristics of the surface: ...
      - 9.10.5.2.4. Specifications shall be given for further important components of the heating system such as, for example, the heater fan, with regard to their method of construction and technical data: ...
    - 9.10.5.3. A brief description of the vehicle type with regard to the combustion heating system and the automatic control: ...
      - 9.10.5.3.1. Layout drawing of the combustion heater, the air inlet system, the exhaust system, the fuel tank, the fuel supply system (including the valves) and the electrical connections showing their positions in the vehicle.
    - 9.10.5.4. Maximum electrical consumption: ..... kW
  - 9.10.6. Components with regard to the protection of the occupants of the front seats in the event of a frontal/lateral/rear collision.

- 9.10.6.1. A detailed description, including photograph(s) and/or drawing(s), of the vehicle type with respect to the structure, the dimensions, the lines and the constituent materials of that part of the vehicle forward of the steering control, including those components designed to contribute to the absorption of energy in the event of an impact against the steering control: ...
- 9.10.6.2. Photograph(s) and/or drawing(s) of vehicle components other than those described in 9.10.6.1 as identified by the manufacturer in agreement with the technical service, as contributing to the behaviour of the steering mechanism in case of impact: ...
- 9.10.6.3. Other components located in the energy absorption zone of the vehicle:
- 9.10.6.3.1. Description of liquid fuel supply system: ...
- 9.10.6.3.2. Description of high voltage BUS and high voltage components located in the energy absorption zone of the vehicle: ...
- 9.10.6.3.3. Description of hydrogen system/components located in the energy absorption zone of the vehicle: ...
- 9.10.7. Burning behaviour of materials used in the interior construction of certain categories of motor vehicles
- 9.10.7.1. Material(s) used for the interior lining of the roof
- 9.10.7.1.1. Number(s) of the component type-approval certificate (s), if available: ...
- 9.10.7.1.2. For materials not approved
- 9.10.7.1.2.1. Base material(s)/designation: ...../.....
- 9.10.7.1.2.2. Composite/single (\*) material, number of layers (\*): ...
- 9.10.7.1.2.3. Type of coating (\*): ...
- 9.10.7.1.2.4. Maximum/minimum thickness: ...../..... mm
- 9.10.7.2. Material(s) used for the rear and side walls
- 9.10.7.2.1. Number(s) of the component type-approval certificate (s), if available: ...
- 9.10.7.2.2. For materials not approved
- 9.10.7.2.2.1. Base material(s)/designation: ...../.....
- 9.10.7.2.2.2. Composite/single (\*) material, number of layers (\*): ...
- 9.10.7.2.2.3. Type of coating (\*): ...
- 9.10.7.2.2.4. Maximum/minimum thickness: ...../..... mm
- 9.10.7.3. Material(s) used for the floor
- 9.10.7.3.1. Number(s) of the component type-approval certificate (s), if available: ...
- 9.10.7.3.2. For materials not approved
- 9.10.7.3.2.1. Base material(s)/designation: ...../.....

- 9.10.7.3.2.2. Composite/single (\*) material, number of layers (\*): ...
- 9.10.7.3.2.3. Type of coating (\*): ...
- 9.10.7.3.2.4. Maximum/minimum thickness: ...../..... mm
- 9.10.7.4. Material(s) used for the upholstery of the seats
  - 9.10.7.4.1. Number(s) of the component type-approval certificate (s), if available: ...
  - 9.10.7.4.2. For materials not approved
    - 9.10.7.4.2.1. Base material(s)/designation: ...../.....
    - 9.10.7.4.2.2. Composite/single (\*) material, number of layers (\*): ...
    - 9.10.7.4.2.3. Type of coating (\*): ...
    - 9.10.7.4.2.4. Maximum/minimum thickness: ...../..... mm
- 9.10.7.5. Material(s) used for the heating and ventilation pipes
  - 9.10.7.5.1. Numbers of the component type-approval certificate (s), if available: ...
  - 9.10.7.5.2. For materials not approved
    - 9.10.7.5.2.1. Base material(s)/designation: ...../.....
    - 9.10.7.5.2.2. Composite/single (\*) material, number of layers (\*): ...
    - 9.10.7.5.2.3. Type of coating (\*): ...
    - 9.10.7.5.2.4. Maximum/minimum thickness: ...../..... Mm
- 9.10.7.6. Material(s) used for luggage racks
  - 9.10.7.6.1. Number(s) of the component type-approval certificate (s), if available: ...
  - 9.10.7.6.2. For materials not approved
    - 9.10.7.6.2.1. Base material(s)/designation: ...../.....
    - 9.10.7.6.2.2. Composite/single (\*) material, number of layers (\*): ...
    - 9.10.7.6.2.3. Type of coating (\*): ...
    - 9.10.7.6.2.4. Maximum/minimum thickness: ...../..... mm
- 9.10.7.7. Material(s) used for other purposes
  - 9.10.7.7.1. Intended purposes: ...
  - 9.10.7.7.2. Number(s) of the component type-approval certificate (s), if available: ...
  - 9.10.7.7.3. For materials not approved

- 9.10.7.7.3.1. Base material(s)/designation: ...../.....
- 9.10.7.7.3.2. Composite/single<sup>(4)</sup> material, number of layers<sup>(4)</sup>: ...
- 9.10.7.7.3.3. Type of coating<sup>(4)</sup>: ...
- 9.10.7.7.3.4. Maximum/minimum thickness: .... / .... Mm
- 9.10.7.8. Components approved as complete devices (seats, separation walls, luggage racks, etc.)
- 9.10.7.8.1. Number(s) of the component type-approval certificate (s): ...
- 9.10.7.8.2. For the complete device: seat, separation wall, luggage racks, etc. <sup>(4)</sup>
- 9.10.8. Gas used as refrigerant in the air-conditioning system: ...
- 9.10.8.1. The air-conditioning system is designed to contain fluorinated greenhouse gases with global warming potential higher than 150: yes/no<sup>(4)</sup>
- 9.10.8.2. If yes, fill in the following points
- 9.10.8.2.1. Drawing and brief description of the air-conditioning system, including the reference or part number and material of the leak components;
- 9.10.8.2.2. Leakage of the air-conditioning system
- 9.10.8.2.4. Reference or part number and material of the components of the system and information about the test (e.g. test report number, number of the approval certificate, etc.): ...
- 9.10.8.3. Overall leakage in g/year of the entire system: ...
- 9.11. **External projections**
- 9.11.1. Photographs of the front, rear and side parts of the vehicle at an angle of 30° to 45° to the vertical longitudinal median plane of the vehicle:
- 9.11.2. Drawings of the 'external surface' to demonstrate compliance with the requirements: ...
- 9.11.3. Drawings of parts of the external surface in accordance with paragraph 6.9.1 to UN Regulation No 26 of the Economic Commission for Europe of the United Nations (UNECE) <sup>(85)</sup>: ...
- 9.11.4. Drawing of bumpers: ...
- 9.11.5. Drawing of the floor line: ...
- 9.12. **Safety belts and/or other restraint systems**
- 9.12.1. Number and position of safety belts and restraint systems and seats on which they can be used

(L = left-hand side, R = right-hand side, C = centre)

		Complete EU type-approval mark	Variant, if applicable	Belt adjustment device for height (indicate yes/no/optional)
First row of seats	L			
	C			
	R			

(L = left-hand side, R = right-hand side, C = centre)				
		Complete EU type-approval mark	Variant, if applicable	Belt adjustment device for height (indicate yes/no/optional)
Second row of seats <sup>(86)</sup>	L			
	C			
	R			

9.12.2. Nature and position of supplementary restraint systems (indicate yes/no/optional)

(L = left-hand side, R = right-hand side, C = centre)				
		Front airbag	Side airbag	Other airbag systems (i.e. knee airbag, etc.)
First row of seats	L			
	C			
	R			
Second row of seats <sup>(86)</sup>	L			
	C			
	R			

9.12.3. Number and position of safety belt anchorages and proof of compliance with UN Regulation No 14 <sup>(87)</sup>, (i.e. number of the type-approval certificate or test report): ...

9.12.4. A brief description of the electrical/electronic components (if any): ...

9.12.5. Description of the seat belt reminder system: ...

9.13. **Safety belt anchorages**

9.13.1. Photographs and/or drawings of the bodywork showing the position and dimensions of the actual and the effective anchorages including the R-points: ...

9.13.2. Drawings of the belt anchorages and parts of the vehicle structure where they are attached (with the material indication): ...

9.13.3. Designation of the types <sup>(88)</sup> of safety belt authorised for fitting to the anchorages with which the vehicle is equipped

			Anchorage location	
			Vehicle structure	Seat structure
First row of seats				
Right-hand seat	Lower anchorages	outboard inboard		
	Upper anchorages			
Centre seat	Lower anchorages	right left		
	Upper anchorages			
Left-hand seat	Lower anchorages	outboard inboard		
	Upper anchorages			

			Anchorage location	
			Vehicle structure	Seat structure
Second row of seats <sup>(86)</sup>				
Right-hand seat	Lower anchorages	outboard inboard		
	Upper anchorages			
Centre seat	Lower anchorages	right left		
	Upper anchorages			
Left-hand seat	Lower anchorages	outboard inboard		
	Upper anchorages			

- 9.13.4. Description of a particular type of safety belt where an anchorage is located in the seat backrest or incorporates an energy dissipating device: ...
- 9.14. **Space for mounting rear registration plates (give range where appropriate, drawings may be used where applicable)**
- 9.14.1. Height above road surface, upper edge: ...
- 9.14.2. Height above road surface, lower edge: ...
- 9.14.3. Distance of the centre line from the longitudinal median plane of the vehicle: ...
- 9.14.4. Distance from the left vehicle edge: ...
- 9.14.5. Dimensions (length × width): ...
- 9.14.6. Inclination of the plane to the vertical: ...
- 9.14.7. Angle of visibility in the horizontal plane: ...
- 9.15. **Rear under-run protection**
- 9.15.1. Presence: yes/no/incomplete <sup>(4)</sup>
- 9.15.2. Drawing of the vehicle parts relevant to the rear under-run protection, i.e. drawing of the vehicle and/or chassis with position and mounting of the widest rear axle, drawing of the mounting and/or fitting of the rear under-run protection. If the under-run protection is not a special device, the drawing shall clearly show that the required dimensions are met: ...
- 9.15.3. In case of a special device, full description and/or drawing of the rear under-run protection (including mountings and fittings), or, if approved as separate technical unit, number of the type-approval certificate: ...
- 9.16. **Wheel guards**
- 9.16.1. Brief description of the vehicle with regard to its wheel guards: ...
- 9.16.2. Detailed drawings of the wheel guards and their position on the vehicle showing the dimensions specified in Figure 1 of Annex II to Commission Regulation (EU) No 1009/2010 <sup>(89)</sup> and taking account of the extremes of tyre/wheel combinations: ...



**9.17. Statutory plates**

- 9.17.1. Photographs and/or drawings of the locations of the statutory plates and inscriptions and of the vehicle identification number: ...
- 9.17.2. Photographs and/or drawings of the statutory plate and inscriptions (completed example with dimensions): ...
- 9.17.3. Photographs and/or drawings of the vehicle identification number (completed example with dimensions): ...
- 9.17.4. Manufacturer's declaration of compliance with Part B of Annex I to Commission Regulation (EU) No 19/2011 <sup>(90)</sup>
- 9.17.4.1. The meaning of characters in the vehicle descriptor section (VDS) of point 2.1. of Part B of Annex I to Regulation (EU) No 19/2011 and, if applicable, the vehicle indicator section (VIS) thereof, to comply with the requirements of section 5.3 of ISO Standard 3779:2009 shall be explained: ...
- 9.17.4.2. If characters in the vehicle descriptor second section are used to comply with the requirements of section 5.4 of ISO Standard 3779:2009 (i.e. model year) these characters shall be indicated: ...

**9.18. Radio interference/electromagnetic compatibility**

- 9.18.1. Description and drawings/photographs of the shapes and constituent materials of the part of the body forming the engine compartment and the part of the passenger compartment nearest to it: ...
- 9.18.2. Drawings or photographs of the position of metal components housed in the engine compartment (e.g. heating appliances, spare wheel, air filter, steering mechanism, etc.): ...
- 9.18.3. Table and drawing of radio-interference control equipment: ...
- 9.18.4. Particulars of the nominal value of the direct current resistance, and, in the case of resistive ignition cables, of their nominal resistance per metre: ...

**9.19. Lateral protection**

- 9.19.1. Presence: yes/no/incomplete <sup>(4)</sup>
- 9.19.2. Drawing of the vehicle parts relevant to the lateral protection, i.e. drawing of the vehicle and/or chassis with position and mounting of the axle(s), drawing of the mountings and/or the fittings of lateral protection device(s). If the lateral protection is achieved without lateral protection device(s) the drawing shall clearly show that the required dimensions are met: ...
- 9.19.3. In the case of lateral protection device(s), full description and/or drawing of such device(s) (including mountings and fittings) or its/their number(s) of the component type-approval certificate(s): ...

**9.20. Spray-suppression system**

- 9.20.1. Presence: yes/no/incomplete <sup>(4)</sup>
- 9.20.2. Brief description of the vehicle with regard to its spray-suppression system and the constituent components: ...
- 9.20.3. Detailed drawings of the spray-suppression system and its position on the vehicle showing the dimensions specified in the figures in Annex VI to Commission Regulation (EU) No 109/2011 <sup>(91)</sup> and taking account of the extremes of tyre/wheel combinations: ...

- 9.20.4. Number(s) of the type-approval certificate(s) of spray-suppression device(s), if available: ...
- 9.21. **Side-impact resistance**
- 9.21.1. A detailed description, including photographs and/or drawings, of the vehicle with respect to the structure, the dimensions, the lines and the constituent materials of the side walls of the passenger compartment (exterior and interior), including specific details of the protection system, where applicable: ...
- 9.22. **Front under-run protection**
- 9.22.1. Presence: yes/no/incomplete (\*)
- 9.22.2. Drawing of the vehicle parts relevant to the front under-run protection, i.e. drawing of the vehicle and/or chassis with position and mounting and/or fitting of the front under-run protection. If the under-run protection is no special device, the drawing shall clearly show that the required dimensions are met: ...
- 9.22.3. In the case of special device, full description and/or drawing of the front under-run protection (including mountings and fittings), or, if approved as a separate technical unit, number of the type-approval certificate: ...
- 9.23. **Pedestrian protection**
- 9.23.1. A detailed description, including photographs and/or drawings, of the vehicle with respect to the structure, the dimensions, the relevant reference lines and the constituent materials of the frontal part of the vehicle (interior and exterior), including detail of any active protection system installed.
- 9.24. **Frontal protection systems**
- 9.24.1. General arrangement (drawings or photographs) indicating the position and attachment of the frontal protection systems:
- 9.24.2. Drawings and/or photographs, where relevant, of air intake grilles, radiator grille, decorative trim, badges, emblems and recesses and any other external projections and parts of the exterior surface which can be regarded as critical (e.g. lighting equipment). If the parts listed in the first sentence are not critical, for documentation purposes they may be replaced by photographs, accompanied if necessary by dimensional details and/or text:
- 9.24.3. Complete details of fittings required and full instructions, including torque requirements, for fitting:
- 9.24.4. Drawing of bumpers:
- 9.24.5. Drawing of the floor line at the vehicle front end:
- 9.25. **Aerodynamic device or equipment**
- 9.25.1. Detailed technical description (including photographs or drawings, as well as a description of the materials) of the vehicle parts relevant to Part C, point 1.4 of Annex I to Commission Regulation (EU) No 1230/2012: ...
- 9.26. **Aerodynamic device or equipment on the front of the vehicle**
- 9.26.1. Vehicle equipped with aerodynamic device or equipment on the front: yes/no (\*)
- 9.26.2. Number of the type-approval certificate of the aerodynamic device or equipment, if available: ...

Or, if not available provide the information below:

9.26.3. Detailed description (including photographs or drawings) of the aerodynamic device or equipment (NB: taken over from the addendum to the type-approval certificate)

9.26.3.1. Construction and materials: ...

9.26.3.2. Locking and adjustment system: ...

9.26.3.3. Attachment and mounting to the vehicle: ...

9.27. **Aerodynamic device or equipment on the rear of the vehicle**

9.27.1. Vehicle equipped with aerodynamic device or equipment on the rear: yes/no (\*)

9.27.2. Number of the type-approval certificate of the aerodynamic device or equipment, if available: ...

Or, if not available provide the information below:

9.27.3. Detailed description (including photographs or drawings) of the aerodynamic device or equipment (NB: taken over from the addendum to the TA certificate)

9.27.3.1. Construction and materials: ...

9.27.3.2. Locking and adjustment system: ...

9.27.3.3. Attachment and mounting to the vehicle: ...

10. LIGHTING AND LIGHT SIGNALLING DEVICES

10.1. Table of all devices: number, make, model, type-approval mark, maximum intensity of main-beam headlamps, colour, tell-tale: ...

10.2. Drawing of the position of lighting and light signalling devices: ...

10.3. For every lamp and reflector specified in UN Regulation No 48<sup>(92)</sup> of the Economic Commission for Europe of the United Nations (UNECE) supply the following information (in writing and/or by diagram)

10.3.1. Drawing showing the extent of the illuminating surface: ...

10.3.2. Method used for the definition of the apparent surface in accordance with paragraph 2.10 of UN Regulation No 48: ...

10.3.3. Axis of reference and centre of reference: ...

10.3.4. Method of operation of concealable lamps: ...

10.3.5. Any specific mounting and wiring provisions: ...

10.4. Dipped beam lamps: normal orientation in accordance to paragraph 6.2.6.1 of UN Regulation No 48:

10.4.1. Value of initial adjustment: ...

10.4.2. Location of indication: ...

10.4.3.	Description/drawing (*) and type of headlamp levelling device (e.g. automatic, stepwise manually adjustable, continuously manually adjustable):	Applicable only for vehicles with headlamp levelling device
10.4.4.	Control device:	
10.4.5.	Reference marks:	
10.4.6.	Marks assigned for loading conditions:	

10.5. A brief description of electrical/electronic components other than lamps (if any): ...

11. CONNECTIONS BETWEEN TOWING VEHICLES AND TRAILERS AND SEMI-TRAILERS

11.1. Class and type of the coupling device(s) fitted or to be fitted: ...

11.2. Characteristics D, U, S and V of the coupling device(s) fitted or minimal characteristics D, U, S and V of the coupling device(s) to be fitted: ..... daN

11.3. Instructions for attachment of the coupling type to the vehicle and photographs or drawings of the fixing points at the vehicle as stated by the manufacturer; additional information, if the use of the coupling type is restricted to certain variants or versions of the vehicle type: ...

11.4. Information of the fitting of special towing brackets or mounting plates: ...

11.5. Number(s) of the type-approval certificate(s): ...

12. MISCELLANEOUS

12.1. Audible warning device(s)

12.1.1. Location, method of affixing, placement and orientation of the device(s), with dimensions: ...

12.1.2. Number of device(s): ...

12.1.3. Number(s) of the type-approval certificate (s): ...

12.1.4. Electrical/pneumatic (\*) circuit diagram: ...

12.1.5. Rated voltage or pressure: ...

12.1.6. Drawing of the mounting device: ...

12.2. Devices to prevent unauthorised use of the vehicle

12.2.1. Protective device

12.2.1.1. A detailed description of the vehicle type with regard to the arrangement and design of the control or of the unit on which the protective device acts: ...

12.2.1.2. Drawings of the protective device and of its mounting on the vehicle: ...

- 12.2.1.3. A technical description of the device: ...
- 12.2.1.4. Details of the lock combinations used: ...
- 12.2.1.5. Vehicle immobiliser
  - 12.2.1.5.1. Number of the type-approval certificate, if available: ...
  - 12.2.1.5.2. For immobilisers not yet approved
    - 12.2.1.5.2.1. A detailed technical description of the vehicle immobiliser and of the measures taken against inadvertent activation: ...
    - 12.2.1.5.2.2. The system(s) on which the vehicle immobiliser acts: ...
    - 12.2.1.5.2.3. Number of effective interchangeable codes, if applicable: ...
- 12.2.2. Alarm system (if any)
  - 12.2.2.1. Number of the type-approval certificate, if available: ...
  - 12.2.2.2. For alarm systems not yet approved
    - 12.2.2.2.1. A detailed description of the alarm system and of the vehicle parts related to the alarm system installed: ...
    - 12.2.2.2.2. A list of the main components comprising the alarm system: ...
- 12.2.3. A brief description of the electrical/electronic components (if any): ...
- 12.3. Towing device(s)
  - 12.3.1. Front: Hook/eye/other (\*)
  - 12.3.2. Rear: Hook/eye/other/none (\*)
  - 12.3.3. Drawing or photograph of the chassis/area of the vehicle body showing the position, construction and mounting of the towing device(s): ...
- 12.4. Details of any non-engine related devices designed to influence fuel consumption (if not covered by other items): ...
- 12.5. Details of any non-engine related devices designed to reduce noise (if not covered by other items): ...
- 12.6. Speed limitation devices
  - 12.6.1. Manufacturer(s): ...
  - 12.6.2. Type(s): ...
  - 12.6.3. Number(s) of the type-approval certificate (s), if available: ...
  - 12.6.4. Speed or range of speeds at which the speed limitation may be set: ..... km/h

## 12.7. Table of installation and use of RF transmitters in the vehicle(s), if applicable: ...

Frequency bands (Hz)	Maximum output power (W)	Antenna position at vehicle, specific conditions for installation and/or use

The applicant for type-approval shall also supply, where appropriate:

*Appendix 1*

A list containing make and type of all electrical and/or electronic components, type approved during this whole vehicle type-approval, concerned by UN Regulation No 10 <sup>(93)</sup> of the Economic Commission for Europe of the United Nations (UNECE).

*Appendix 2*

Schematics or drawing of the general arrangement of electrical and/or electronic components, type approved during this whole vehicle type-approval, concerned by UN Regulation No 10 and the general wiring harness arrangement.

*Appendix 3*

Description of vehicle chosen to represent the type

Body style:

Left- or right-hand drive <sup>(4)</sup>

Wheelbase:

*Appendix 4*

Relevant test report(s) supplied by the manufacturer or approved/recognised laboratories for the purpose of drawing up the type-approval certificate

12.7.1. Vehicle equipped with a 24 GHz short-range radar equipment: yes/no <sup>(4)</sup>

12.8. eCall system

12.8.1. Presence: yes/no <sup>(4)</sup>

12.8.2. Technical description and drawings of the device or type-approval certificate number(s): ...

12.9. Acoustic Vehicle Alerting System (AVAS)

12.9.1. The number of the approval certificate issued on the basis of requirements laid down in UN Regulation No 138 <sup>(94)</sup> of the Economic Commission for Europe of the United Nations (UNECE):

or

12.9.2. Complete reference to the test results of AVAS sound emission levels, measured in accordance with Regulation (EU) No 540/2014 <sup>(95)</sup> of the European Parliament and of the Council.

12.10. Devices or systems with driver selectable modes which influence CO<sub>2</sub> emissions and/or criteria emissions and do not have a predominant mode: yes/no <sup>(4)</sup>

12.10.1. Charge sustaining test (if applicable) (state for each device or system)

12.10.1.1. Best case mode: ...

12.10.1.2. Worstcase mode: ...

- 12.10.2. Charge depleting test (if applicable) (state for each device or system)
  - 12.10.2.1. Best case mode: ...
  - 12.10.2.2. Worstcase mode: ...
- 12.10.3. Type 1 test (if applicable) (state for each device or system)
  - 12.10.3.1. Best case mode: ...
  - 12.10.3.2. Worstcase mode: ...
- 13. **SPECIAL PROVISIONS FOR BUSES AND COACHES**
  - 13.1. Class of vehicle: Class I/Class II/Class III/Class A/Class B (\*)
    - 13.1.1. Number of the type-approval certificate of bodywork approved as a separate technical unit: ...
    - 13.1.2. Chassis types where the type-approved bodywork can be installed (manufacturer(s), and types of incomplete vehicle): ...
  - 13.2. **Area for passengers (m<sup>2</sup>)**
    - 13.2.1. Total (S<sub>0</sub>): ...
    - 13.2.2. Upper deck (S<sub>0a</sub>) (\*): ...
    - 13.2.3. Lower deck (S<sub>0b</sub>) (\*): ...
    - 13.2.4. For standing passengers (S<sub>1</sub>): ...
  - 13.3. **Number of passengers (seated and standing)**
    - 13.3.1. Total (N): ...
    - 13.3.2. Upper deck (N<sub>a</sub>) (\*): ...
    - 13.3.3. Lower deck (N<sub>b</sub>) (\*): ...
  - 13.4. **Number of passengers seated**
    - 13.4.1. Total (A): ...
    - 13.4.2. Upper deck (A<sub>a</sub>) (\*): ...
    - 13.4.3. Lower deck (A<sub>b</sub>) (\*): ...
    - 13.4.4. Number of wheelchair user accessible positions: ...
  - 13.5. Number of service doors: ...
  - 13.6. Number of emergency exits (doors, windows, escape hatches, intercommunication staircase and half staircase): ...
    - 13.6.1. Total: ...

- 13.6.2. Upper deck (<sup>4</sup>): ...
- 13.6.3. Lower deck (<sup>4</sup>): ...
- 13.7. Volume of luggage compartments (m<sup>3</sup>): ...
- 13.8. Area of luggage transportation on the roof (m<sup>2</sup>): ...
- 13.9. Technical devices facilitating the access to vehicles (e.g. ramp, lifting platform, kneeling system), if fitted: ...
- 13.10. Strength of superstructure
  - 13.10.1. Number of the type-approval certificate, if available: ...
  - 13.10.2. For superstructures not yet approved
    - 13.10.2.1. Detailed description of the superstructure of the vehicle type including its dimensions, configuration and constituent materials and its attachment to any chassis frame: ...
    - 13.10.2.2. Drawings of the vehicle and those parts of its interior arrangement which have an influence on the strength of the superstructure or on the residual space: ...
    - 13.10.2.3. Position of centre of gravity of the vehicle in running order in the longitudinal, transverse and vertical directions: ...
    - 13.10.2.4. Maximum distance between the centre lines of the outboard passenger seats: ...
- 13.11. Points of UN Regulation No 66 (<sup>96</sup>) of the Economic Commission for Europe of the United Nations (UN/ECE) to be accomplished and demonstrated for this technical unit: ...
- 13.12. Drawing with dimensions showing the interior arrangement as regards the seating positions, area for standees, wheelchair user(s), luggage compartments including racks and ski-box, if any
- 14. SPECIAL PROVISIONS FOR VEHICLES INTENDED FOR THE TRANSPORT OF DANGEROUS GOODS
  - 14.1. **Electrical equipment according to UN Regulation No 105 (<sup>97</sup>) of the Economic Commission for Europe of the United Nations (UN/ECE)**
    - 14.1.1. Protection against overheating of conductors: ...
    - 14.1.2. Type of circuit breaker: ...
    - 14.1.3. Type and operation of battery master switch: ...
    - 14.1.4. Description and location of safety barrier for tachograph: ...
    - 14.1.5. Description of permanently energised installations. Indicate the EN standard applied: ...
    - 14.1.6. Construction and protection of electrical installation situated to the rear of the driver's compartment: ...
  - 14.2. **Prevention of fire risks**
    - 14.2.3. Position and heat protection of engine: ...
    - 14.2.4. Position and heat protection of the exhaust system: ...
    - 14.2.5. Type and design of the endurance braking systems heat protection: ...
    - 14.2.6. Type, design and position of combustion heaters: ...



15. REUSABILITY, RECYCLABILITY AND RECOVERABILITY
- 15.1. Version to which the reference vehicle belongs: ...
- 15.2. Mass of the reference vehicle with bodywork or mass of the chassis with cab, without bodywork and/or coupling device if the manufacturer does not fit the bodywork and/or coupling device (including liquids, tools, spare wheel, if fitted) without driver: ...
- 15.3. Mass of materials of the reference vehicle: ...
- 15.3.1. Mass of material taken into account at the pre-treatment step <sup>(98)</sup>: ...
- 15.3.2. Mass of the material taken into account at the dismantling step <sup>(98)</sup>: ...
- 15.3.3. Mass of material taken into account at the non-metallic residue treatment step, considered as recyclable <sup>(98)</sup>: ...
- 15.3.4. Mass of material taken into account at the non-metallic residue treatment step, considered as energy recoverable <sup>(98)</sup>: ...
- 15.3.5. Materials breakdown <sup>(98)</sup>: ...
- 15.3.6. Total mass of materials, which are reusable and/or recyclable: ...
- 15.3.7. Total mass of materials, which are reusable and/or recoverable: ...
- 15.4. **Rates**
- 15.4.1. Recyclability rate 'R<sub>cyc</sub>' (%): ...
- 15.4.2. Recoverability rate 'R<sub>cov</sub>' (%): ...
16. ACCESS TO VEHICLE REPAIR AND MAINTENANCE INFORMATION
- 16.1. Address of principal website for access to vehicle repair and maintenance information: ...
- 16.1.1. Date from which it is available (no later than 6 months from the date of type-approval): ...
- 16.2. Terms and conditions of access to website: ...
- 16.3. Format of the vehicle repair and maintenance information accessible through website: ...
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